Introduction to Environmental Impact Assessment
4th edition

John Glasson, Riki Therivel and Andrew Chadwick

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SEA

Preface to the first edition

There has been a remarkable and refreshing interest in environmental issues over the past few years. A major impetus was provided by the 1987 Report of the World Commission on the Environment and Development (the Brundtland Report); the Rio Summit in 1992 sought to accelerate the impetus. Much of the discussion on environmental issues and on sustainable development is about the better management of current activity in harmony with the environment. However, there will always be pressure for new development. How much better it would be to avoid or mitigate the potential harmful effects of future development on the environment at the planning stage. Environmental impact assessment (EJA) assesses the impacts of planned activity on the environment in advance, thereby allowing avoidance measures to be taken: prevention is better than cure.

Environmental impact assessment was first formally established in the USA in 1969. It has spread worldwide and received a significant boost in Europe with the introduction of an EC Directive on EIA in 1985. ·1 his was implemented in the UK in 1988. Subsequently there has been a rapid growth in EIA activity, and over 300 environmental impact statements (EISs) are now produced in the UK each year. EIA is an approach in good currency. It is also an area where many of the practitioners have limited experience. This text provides a com- prehensive introduction to the various dimensions of EIA. It has been written with the requirements of both undergraduate and postgraduate students in mind. It should also be of considerable value to those in practice - planners, developers and various
interest groups. EIA is on a rapid 'learning curve'; this text is offered as a point on the curve.

·1 he book is structured into four parts. ·1 he first provides an introduction to the principles of EIA and an overview of its development and agency and legislative context. Part 2 provides a step-by- step discussion and critique of the EIA process. Part 3 examines current practice, broadly in the UK and in several other countries, and in more detail through selected UK case studies. Part 4 considers possible future developments. It is likely that much more of the EIA iceberg will become visible in the 1990s and beyond. An outline of important and associated developments in environmental auditing and in strategic environmental assessment concludes the text.

Although the book has a clear UK orientation, it does draw extensively on EIA experience worldwide, and it should be of interest to readers from many countries. The book seeks to highlight best practice and to offer enough insight to methods, and to supporting references, to provide valuable guidance to the practitioner. For infor- mation on detailed methods for assessment of impacts in particular topic areas (e.g. landscape, air quality, traffic impacts), the reader is referred to the complementary volume, Methods of' e11viro11- 111e11tal impact assessment (Morris and Therivel, 1995, London, UCL Press).

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Preface to the fourth edition

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The aims and scope of this fourth edition are unchanged from those of the first edition. However, as noted in the preface to the first edition, EIA continues to evolve and adapt, and any commen- tary on the subject must be seen as part of a continuing discussion. The worldwide spread of EIA is becoming even more comprehensive. In the European Union there is now over 25 years' experience of the implementation of the pioneering EIA Directive, including 10 years' experience of the important 1999 amendments. There has been considerable interest in the development of the EIA process, in strengthening perceived areas of weakness, in extending the scope of activity and also in assessing effectiveness. Reflecting such changes, this fully revised edition updates the commentary by introducing and developing a number of issues that are seen as of growing importance to both the student and the practitioner of EIA.

The structure of the first edition has been retained, plus much of the material from the third edition, but considerable variations and additions have been made to specific sections. In Part 1 (on principles and procedures), the importance of an adaptive EIA, plus the burgeoning range of EA activity, are addressed further. In the EU context, the implementation of the amended EIA Directive is discussed more fully, including the divergent practice across the widening range of Member States. The specific new 2011 regulations and procedures operational in the UK are set out in Chapter 3. In Part 2 (discussion of the EIA process), most elements have been updated, including screening and scoping, alternatives, impact identi- fication, prediction, participation and presentation, mitigation and enhancement, and monitoring and auditing.

We have made major changes to Part 3 (overview of practice), drawing on the findings of important reviews of EIA effectiveness and operation in practice. For example, Chapter 8 includes much new material on the implication of legal challenges in EIA. Chapter 9 includes some new practice case studies. Most of the case studies are UK-based and involve EIA at the individual project level, although two examples of SEA are also discussed, plus new topics such as health impact assessment. While it is not claimed that the selected case studies all represent best examples of EIA practice, they do include some novel and innovative approaches towards particular issues in EIA, such as new methods of public participation and the treatment of cumulative effects. They also draw attention to some of the limitations of the process in practice. Chapter 10 (Comparative practice) has also had a major revision, reflecting, for example, growing experience in African countries, China and countries in transition, and major reviews for some well-established EIA systems in, for example, Canada and Australia.

Part 4 of the book (Prospects) has also been substantially revised to reflect some of the changing prospects for EIA. Chapter 11 discusses the need for strategic environmental assessment (SEA) and some of its limitations. It reviews the status of SEA in the USA, European Union and UNECE, and China. It then discusses in more detail how the European SEA Directive is being implemented in the UK. It concludes with the results of recent research into the effectiveness of the SEA Directive. Chapter 12 has been extensively revised and extended. It includes, for example, more consideration of cumulative impacts, socio- economic impacts, health impact assessment, equalities impact assessment, appropriate assess- ment, the new area of resilience thinking, and the vitally important topic of planning for climate change in EIA, plus possible shifts towards more integrated assessment. The chapter concludes with a discussion of the parallel and complementary development of environmental management systems and audits. Together, these topics act as a kind of action list for future improvements to EIA. This chapter in particular, but also much else in the book, draws on some of the findings of recent reviews of EIA practice undertaken by, among others, the EC, the IAIA (International Association for Impact Assessment) and the IEMA (the Institute of Environmental Management and Assessment).

The Appendices include the full versions of the amended EIA Directive and the SEA Directive, a revised IAU EIS review package, and a guide to key EIA journals and websites worldwide.

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Office of the Deputy Prime Minister (Box 11.2)

Abbreviations and acronyms

••

AA
Appropriate
CEAA
Canadian

ABI
UK Annual Business Inquiry

Agency

ADB
African Development Bank
CEAM
Cumulative effects assessment and

ADB
Asian Development Bank

management

AEE
Assessment of environmental effects
CEARC
Canadian Environmental Assessment

AEP
Association of Environmental

Research Council

Professionals

CEC
Commission of the European

ANZECC
Australia and New Zealand

Communities

Environment and Conservation
CEGB
Central Electricity Generating Board

Council
CEMP
Construction environmental

AONB
Area of Outstanding Natural Beauty

management plan

APC
Air pollution control
CEPA
Commonwealth Environmental

API
Assessment on Proponent Information

Protection Agency (Australia)

(WA)
CEQ
US Council on Environmental

AQMA
Air quality management area

Quality

BAA
BAA Airports Limited (previously
CF.QA
California Environmental Quality

British Airports Authority)

Act

BANANA
Build absolutely nothing anywhere
CHP
Combined heat and power

near anything
CIA
Cultural impact assessment

BG
Bulgaria
CIE

Community impact evaluation

BIO
Bio Intelligence Service S.A.S.
CISDL
Centre for International Sustainable

BME
Black and minority ethnic

Development Law

BP
BP (previously British Petroleum)
CITES
Convention on Trade in Endangered

BPEO
Best practicable environmental

Species

BS
option
British Standard
CO2
COWi
Carbon dioxide
COWi A/S

BWEA
British Wind Energy Association
CPO
Compulsory purchase order

CAREC
Regional Environmental Centre for
CPRE
Campaign to Protect Rural England

Central Asia
CRM
Contingent ranking method

CBA
Cost-benefit analysis
CRS
US Congressional Research Service

cc
County Council
CRTN
Calculation of road traffic noise

CCGT
Combined-cycle gas turbine
CSR
Corporate social responsibility

CCHP
Combined cooling heat and power
CVM
Contingent valuation method

ccs
Carbon capture and storage
CY
Cyprus

ccw
Countryside Council for Wales
CZ
Czech Republic

CE
Categorical exclusion
dB
Decibels

CEA
Cumulative effects assessment
dBA
A-weighted decibels

DA
Devolved
EPA
West

OBIS
UK Department for Business,

Protection Authority

Innovation and Skills
EPB
Environmental Protection Bureau

DC
District Council

(China)

DCLG
UK Department for Communities and
EPBCA
Environmental Protection and Bio-

Local Government

diversity Conservation Act (Australia)

DECC
UK Department of Energy and
EPD
Hong Kong Environmental Protection

Climate Change

Department

DEFRA
UK Department for Environment,
Eq!A

Equality impact assessment

Food and Rural Affairs
ERM
Environmental Resources Management

DETR
UK Department of Environment,

Limited

Transport and the Regions
ES
Environmental statement

DFID
UK Department for International
ESRC
Economic and Social Research Council

Development
ETSU
Energy Technology Support Unit

DfT
UK Department for Transport
EU
European Union

DG
Directorate General (CEC)
FEARO
Federal Environmental Assessment

DMRB
Design manual for roads and bridges

Review Office

DoE
UK Department of the Environment
FEIS
Final environmental impact statement

DOEn
UK Department of Energy
FHWA
US Federal Highway Administration

DoT
UK Department of Transport
FoE
Friends of the Earth

DTI
UK Department for Trade and
FONS!
Finding of no significant impact

Industry
Gl; G2
Generation 1; Generation 2

EA
Environmental assessment
GAM
Goals achievement matrix

EA
UK Environment Agency
GHG
Greenhouse gases

EAGGF
European Agricultural Guidance and
GHK
GHK Consulting Limited

Guarantee Fund
GIS
Geographical information systems

EAP
Environmental action plan
GNP
Gross national product

EBRD
European Bank for Reconstruction and
GP
General practitioner

Development
GPDO
General Permitted Development

EC
European Commission

Order

EcIA
Ecological impact assessment
GW
Gigawatt

ECJ
European Court of Justice
ha
Hectare

EDF
Electricite de France
HEP
Hydro-electric power

EE
Estonia
HGV
Heavy goods vehicle

EEA
European Environment Agency
HIA
Health impact assessment

EIA
 Environmental impact assessment
 HMG
 Her Majesty's Government

EIB
 European Investment Bank
 HMIP
 Her Majesty's Inspectorate of Pollution

EID
 Environmental impact design
 HMSO
 Her Majesty's Stationery Office

ElR
 Environmental impact report
 HPF
 Household production function

EIR
 Environmental impact review
 HPM
 Hedonic price methods

EIS
 Environmental impact statement
 HRA
 Habitats regulation assessment

EM&A
 Environmental monitoring and audit
 HSE
 Health and Safety Executive

EMAS
 Eco-Management and Audit Scheme
 HU
 Hungary

EMP
 Environmental management plan
 HWS
 Hampshire Waste Services

EMS
 Environmental management system
 IA
 Impact assessment

EN
 English Nature
 !AJA
 International Association for Impact

ENDS
 Environmental Data Services

 Assessment

EPA
 UK Environmental Protection Act
 !AU
 Impacts Assessment Unit (Oxford

EPA

US Environmental Protection Act

Brookes)

EPA
US Environmental Protection Agency
!EA
Institute of Environmental Assessment

!EMA
Institute
NEPA
US

Management and Assessment
NGC
National Grid Company

IFI
International Funding Institution
NGO
Non-governmental organization

IIA
Integrated impact assessment
NHS
National Health Service

IMO
Index of Multiple Deprivation
NIMBY
Not in my back yard

INEM
International Network for
NOX
Nitrogen oxide

Environmental Management
NPDV
Net present day value

IOCGP
Inter-organizational Committee on
NPS
National Policy Statement

Guidelines and Principles for Social
NSIP
Nationally significant infrastructure

Impact Assessment

project

IPC
Infrastructure Planning Commission

NTS
Non-technical summary

IPC
Integrated pollution control
ODA
Olympic Delivery Authority

IPCC
Intergovernmental Panel on Climate
ODPM
UK Office of the Deputy Prime

Change

Minister

!PHI
Institute of Public Health in Ireland
OECD
Organisation for Economic

ISO
International Organization for

Co-operation and Development

Standardization
OISD
Oxford Institute for Sustainable

IWM
Institute of Waste Management

Development

JEAPM
Journal of Environmental Assessment
Policy and Management
OJ
Official Journal of the European
Communities

JNCC
Joint Nature Conservancy Council
OTP
Operational Transport Programme

KSEIA
Korean Society of Environmental
PADC
Project Appraisal for Development

Impact Assessment

Control

kV
Kilovolt
PAS
Planning Advisory Service

Lio

Noise level exceeded for no more than
PBS
Planning balance sheet

10 per cent of a monitoring period
PEIR
Programme environmental impact

LB
London Borough

report

LCA
Life cycle assessment
PEIS
Programmatic environmental impact

LNG
Liquified natural gas

statement

LPA
Local planning authority
PER
Public Environmental Review (WA)

LT
Lithuania
PIC
Partnerships in Care

LTP
Local transport plan
PL
Poland

I:rP3
·1 hird local transport plan
PMIO
Particulate matter of less than 10

LULU
Locally unacceptable land uses

microns in diameter

LV
Latvia
PPG
Planning Policy Guidance

MAFF
UK Ministry of Agriculture, Forestry
and Fisheries
PPPs
pppp
Policies, plans and programmes
Policy, plan, programme or project

MAUT
Multi-attribute utility theory
PPS
Planning policy statement

MBC
Metropolitan Borough Council
PWR
Pressurized water reactor

MCA
Multi-criteria assessment
QBL
Quadruple bottom line

MCDA
Multi-criteria decision analysis
QOLA
Quality of life assessment

MEA
Manual of Environmental Appraisal
RA
Resilience Alliance

MMO
Marine Management Organization
RA
Risk assessment

(UK)
RMA
Resource Management Act (NZ)

MoD
UK Ministry of Defence
RO
Romania

MOEP
Ministry of Environmental Protection
ROD
Record of decision

(China)
RSPB
Royal Society for the Protection of

MT
Malta

Birds

MW
Megawatt
RTPI
Royal Town Planning Institute

NE
Natural England
S106
Section 106

SA
Sustainability
TBL

Triple

SAC
Special Area of Conservation
T&CP
Town and country planning

SAIEA
Southern African Institute for
TIA
Transport impact assessment

Environmental Assessment
TRL
Transport Research Laboratory

SAVE
SAVE Britain's Heritage
UKNEA
UK National Ecosystem Assessment

SD
Sustainable development
UN
United Nations

SOD
Scottish Development Department
UNCED
United Nations Conference on

SEA
Strategic environmental assessment

Environment and Development

SEERA
South East England Regional
UNECE
United Nations Economic

Assembly

Commission for Europe

S&EIA
Socio-economic and environmental
UNEP
United Nations Environment

SEl'A
impact assessment
Scottish Environment Protection
us
Programme United States

Agency
USJ\ID
United States Agency for International

SI

Slovenia

Development

SIA
Social impact assessment
VEC
Valued ecosystem component

SK
Slovakia
VMP
Visitor management plan

SNH
Scottish Natural Heritage
VROM
Netherlands Ministry of Housing,

SNIFFER
Scotland and Northern Ireland Forum

Spatial Planning and the Environment

for Environmental Research
WA
Western Australia

S02
Sulphur dioxide
WBCSD
World Business Council for

SOER
State of the Environment Report

Sustainable Development

SoS
Secretary of State
WHO
World Health Organization

SPA
Special Protection Arca
WID
USAID Women in Development

SSE
Stop Stansted Expansion
WTA
Willingness to accept

SSSI
Site of Special Scientific Interest
WTP
Willingness to pay

Part 1

Principles and procedures

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1 Introduction and principles

••

1 .1 Introduction

Over the last four decades there has been a remarkable growth of interest in environmental issues - in sustainability and the better man- agement of development in harmony with the environment. Associated with this growth of interest has been the introduction of new legis- lation, emanating from national and international sources such as the European Commission, that seeks to influence the relationship between devel- opment and the environment. Environmental impact assessment (EIA) is an important example. EIA legislation was introduced in the USA over 40 years ago. A European Community (EC) directive in 1985 accelerated its application in EU Member States and it has spread worldwide. Since its introduction in the UK in 1988, it has been a major growth area for planning practice; the originally anticipated 20 environmental impact statements (EIS) per year in the UK has escalated to several hundreds, and this is only the tip of the iceberg. The scope of EIA continues to widen and grow.
It is therefore perhaps surprising that the intro- duction of EIA met with strong resistance from many quarters, particularly in the UK. Planners argued, with partial justification, that they were already making such assessments. Many devel- opers saw it as yet another costly and time-
consuming constraint on development, and central government was also unenthusiastic. Interestingly, initial UK legislation referred to environmental assessment (EA), leaving out the apparently politically sensitive, negative-sounding reference to impacts. The scope of the subject continues to evolve. This chapter therefore intro- duces EIA as a process, the purposes of this process, types of development, environment and impacts, and current issues in EIA.

1 .2 The nature of EIA

Definitions of ElA abound. They range from the oft-quoted and broad definition of Munn (1979), which refers to the need 'to identify and predict the impact on the environment and on man's health and well-being of legislative proposals, policies, programmes, projects and operational procedures, and to interpret and communicate information about the impacts', to the narrow and early UK DoE (1989) operational definition:
1

developer and from other sources, and taken into account by the planning authority in forming their judgements on whether the development should go ahead.

UNECE (1991) had an altogether more suc- cinct and pithy definition: 'an assessment of the impact of a planned activity on the environ- ment'. The EU EIA Directive requires an assess- ment of the effects of certain public and private projects, which are likely to have significant effects on the environment, before development consent is granted; it is procedurally based (see Appendix 1). The EIA definition adopted by the International Association for Impact Assessment (IAIA 2009) is 'the process of identifying, predict- ing, evaluating and mitigating the biophysical, social and other relevant effects of proposed development proposals prior to major decisions being taken and commitments made'. This process emphasis is now explored further.

In essence, EIA is e1 process, a systematic process that examines the environmental consequences of

Figure 1.1

Important steps in the EIA process
Note that EIA should be a cyclical process, with considerable interaction between the various steps. For example, public participation can be useful at most stages of the process; monitoring systems should relate to parameters established in the initial project and baseline descriptions.
development actions, in advance. The emphasis, compared with many other mechanisms for environmental protection, is on prevention. Of • course, planners have traditionally assessed the impacts of developments on the environment,
but invariably not in the systematic, holistic and multidisciplinary way required by EIA. The process involves a number of steps, as outlined in Figure I.I. •
The steps are briefly described below, pending a much fuller discussion in Chapters 4-7. It should be noted at this stage that, although the steps are outlined in a linear fashion, EIA should be a cyclical
activity, with feedback and interaction between the • various steps. It should also be noted that practice can and does vary considerably from the process illustrated in Figure 1.1. For example, UK EIA legislation still does not require post-decision • monitoring. The order of the steps in the process may also vary.

•
Project screening narrows the application of

EIA to those projects that may have signifi- • cant environmental impacts. Screening may be partly determined by the EIA regulations operating in a country at the time of assess- ment.

•
Scoping seeks to identity at an early stage, from • all of a project's possible impacts and from all

the alternatives that could be addressed, those that are the crucial, significant issues. •

•
The consideration of altenurtives seeks to ensure that the proponent has considered other feasible approaches, including alternative • project locations, scales, processes, layouts, operating conditions and the 'no action' option.

•
The description of the project/development action • includes a clarification of the purpose and rationale of the project, and an understand-

ing of its various characteristics - including stages of development, location and pro- • cesses.

•
The description of the environmental baseline includes the establishment of both the pre- sent and future state of the environment, in the absence of the project, taking into 1.2.3 Environmental impact statements: the documentation

1.3.1
1 An aid to decision-making

1.3.2
An aid to the formulation of development actions

1.3.3
A vehicle for stakeholder consultation and participation

1.3.4
An instrument for sustainable development

account changes resulting from natural events and from other human activities.
The identification of the main impacts brings together the previous steps with the aim of ensuring that all potentially significant envir- onmental impacts (adverse and beneficial) are identified and taken into account in the process.
The prediction of impacts aims to identify the magnitude and other dimensions of identified change in the environment with a project/ action, by comparison with the situation without that project/action.
The evaluation and assessment of significance assesses the relative significance of the pre- dicted impacts to allow a focus on the main adverse impacts.
Mitigation involves the introduction of meas- ures to avoid, reduce, remedy or compensate for any significant adverse impacts. In addi- tion enhancement involves the development of beneficial impacts where possible.
Public consultation and participation aim to ensure the quality, comprehensiveness and effectiveness of the EIA, and that the public's views are adequately taken into considera- tion in the decision-making process.
EIS presentation is a vital step in the process.
If done badly, much good work in the EIA may be negated.
Review involves a systematic appraisal of the quality of the EIS, as a contribution to the decision-making process.
Decision-making on the project involves a consideration by the relevant authority of the EIS (including consultation responses) together with other material considerations. Post-decision monitoring involves the recording of outcomes associated with development impacts, after a decision to proceed. It can contribute to effective project management. Auditing follows from monitoring. It can involve comparing actual outcomes with predicted outcomes, and can be used to assess the quality of predictions and the effectiveness of mitigation. It provides a vital step in the EIA learning process.
The EIS documents the information about and estimates of impacts derived from the various steps in the process.1 Prevention is better than cure; an EIS revealing many significant unavoidable adverse impacts would provide valuable information that could contribute to the abandonment or substan- tial modification of a proposed development action. Where adverse impacts can be successfully reduced through mitigation measures, there may be a different decision. Table 1. I provides an example of the content of an EIS for a project.

Table 1.1 An EIS for a project - example of contents Non-technical summary

Part 1: Introduction, methods and key issues Introduction
Methodology
Summary of key issues

Part 2: Background to the proposed development Preliminary studies: need, planning, alternatives and site
selection
Site description, baseline conditions Description of proposed development
Development programme, including site preparation, construction, operation, decommissioning and reS1oration (as appropriate)
Part 3: Environmental impact assessment - topic areas Land use
Geology, topography and soils Hydrology and water quality Air quality
Climate change
Ecology: terrestrial and aquatic Noise and vibration
Socio-economics Transport
Landscape, visual quality Historic environment Recreation and amenity
Interrelationships between effects Cumulative impacts
Summary of residual impacts

Parl 4: Follow-up and managemenl Monitoring of impacts
Management of impacts
The 1wn-tecl111icnl s11111111ary is an important element in the documentation; EIA can be com- plex, and the summary can help to improve communication with the various parties involved.
Reflecting the potential complexity of the process, an i11trod11ctio11 should clarify, for

example, who the developer is, who has produced the EIS, and the relevant legal framework. Also at the beginning, a methodology section, provides an opportunity to clarify some basic information (e.g. what methods have been used, how the key issues were identified, who was consulted and how, what difficulties have been encountered, and what are the limitations of the EIA)·. 1he background to the proposed development covers the early steps in the EIA process, including clear descriptions of a project, and baseline conditions (including relevant planning policies and plans).
Within each of the topic areas of an EIS there would normally be a discussion of existing conditions, predicted impacts, scope for mitigation and enhancement, and residual impacts. The list here is generic, and there are some topics that are still poorly covered, for example climate change and cumulative impacts (as appropriate). A con- cluding section, although often omitted from EISs, should cover key follow-up issues, including monitoring and management. Environmental impact assessment and EIS practices vary from study to study, from country to country, and best practice is constantly evolving. An early UN study of EIA practice in several countries advocated changes in the process and documentation (UNECE 1991). These included giving a greater emphasis to the socio-economic dimension, to public participation and to 'after the decision' activity, such as monitoring. More recent reviews of the operation of the amended EC Directive (CEC 2003a, 2009) raised similar issues, and other emerging issues, a decade later (see Chapter 2). Sadler (1996) provided a wider agenda for change based on a major international study of the effectiveness of EIA, being updated in 2010-11 (see Chapters 8 and 12).

1 .3 The purposes of EIA

EIA is an aid to decision-making. For the decision- maker, for example a local authority, it provides a systematic examination of the environmental implications of a proposed action, and sometimes alternatives, before a decision is taken. The EIS can be considered by the decision-maker along with other documentation related to the planned activity. EIA is normally wider in scope and less quantitative than other techniques, such as cost-benefit analysis (CBA). It is not a substitute for decision-making, but it docs help to clarify some of the trade-offs associated with a proposed development action, which should lead to more informed and structured decision-making. The EIA process has the potential, not always taken up, to be a basis for negotiation between the developer, public interest groups and the planning regulator. This can lead to an outcome that balances well the interests of the development action and the environment.

Developers may see the EIA process as another set of hurdles to jump before they can proceed with their various activities; the process can be seen as yet another costly and time-consuming activity in the development consent process. However, EIA can be of great benefit to them, since it can provide a framework for considering location and design issues and environmental issues in parallel. It can be an aid to the formulation of development actions, indicating areas where a project can be modified to minimize or eliminate altogether its adverse impacts on the environment. The consideration of environmental impacts early in the planning life of a development can lead to more environmentally sensitive development; to improved relations between the developer, the planning authority and the local communities; to a smoother development consent process; and sometimes to a worthwhile financial return on the extra expenditure incurred. O'Riordan (1990) links
such concepts of negotiation and redesign to the important environmental themes of 'green consumerism' and 'green capitalism'. The growing demand by consumers for goods that do no environmental damage, plus a growing market for clean technologies, is generating a response from developers. EIA can be the signal to the developer of potential conflict; wise developers may use the process to negotiate 'environmental gain' solutions, which may eliminate or offset negative environmental impacts, reduce local opposition and avoid costly public inquiries. This can be seen in the wider and contemporary context of corporate social responsibility (CSR) being increas- ingly practised by major businesses (Crane et al. 2008).

Development actions may have wide-ranging impacts on the environment, affecting many different groups in society. There is increasing emphasis by government at many levels on the importance of consultation and participation by key stakeholders in the planning and develop- ment of projects; see for example the 'Aarhus Convention' (UNECE 2000) and the EC Public Participation Directive (CEC 2003b). EIA can be a very useful vehicle for engaging with communities and stakeholders, helping those potentially affected by a proposed development to be much better informed and to be more fully involved in the planning and development process.

Existing environmentally harmful developments have to be managed as best as they can. In extreme

cases, they may be closed down, but they can still leave residual environmental problems for decades to come. It would be much better to miti- gate the harmful effects in advance, at the plan- ning stage, or in some cases avoid the particular development altogether. Prevention is better than cure. This is the theme of the pioneering US and EC legislation on EIA. For example, the preamble to the 1985 EC EIA Directive includes 'the best
environmental policy consists in preventing the creation of pollution or nuisances at source, rather than subsequently trying to counteract their effects' (CEC 1985). This of course leads on to the funda- mental role of EIA as an instrument for sustain- able development - a role some writers have drawn attention to as one often more hidden than it should be when EIA effectiveness is being assessed Oay et al. 2007).

The nature of sustainable development

Economic development and social development must be placed in their environmental contexts. The classical work by Boulding (1966) vividly portrays the dichotomy between the 'throughput economy' and the 'spaceship economy' (Figure 1.2). The economic goal of increased gross 11atio11al product (GNP), using more inputs to produce more goods and services, contains the seeds of its own destruction. Increased output brings with it not only goods and services, but also more waste products. Increased inputs demand more resources. The natural environment is the 'sink' for the wastes and the 'source' for the resources. Environ- mental pollution and the depletion of resources are invariably the ancillaries to economic develop- ment.

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Figure 1.2

The economic development process in its environmental context (adapted from Boulding 1966)
The interaction of economic and social develop- ment with the natural environment and the reciprocal impacts between human actions and the biophysical world have been recognized by governments from local to international levels, and attempts have been made to manage the interaction better. However towards the end of the first decade of the twentieth-first century, the European Environment Agency report, European Environment - State and Outlook 2010 (EEA 2010), still showed some good progress mixed with remaining fundamental challenges, with poten- tially very serious consequences for the quality of the environment. For example, while greenhouse gas emissions have been cut and the EU is on track to reach a reduction target of 20 per cent by 2020, the Member States still produced close to S billion tonnes of CO2 equivalent emissions in 2008. Similarly while Europe's waste management has shifted steadily from landfill to recycling and prevention, still half of the 3 billion tonnes of total waste generated in the EU-27 in 2006 was landfilled. In nature and biodiversity, Europe has expanded its Natura 2000 network of protected areas to cover 18 per cent of EU land, but missed its 2010 target to halt biodiversity loss. Europe's freshwaters are affected by water scarcity, droughts, floods, physical modifications and the continuing presence of a range of pollutants. Both ambient air and water quality remain inadequate and health impacts are widespread. We also live in an inter- connected world. European policy-makers aren't only contending with complex systematic inter- actions within Europe. ·1 here arc also unfolding global drivers of change that are likely to affect Europe's environment, and many are beyond Europe's control. Some environmental trends are likely to be even more pronounced in developing countries, where, because population growth is greater and current living standards lower, there will be more pressure on environ- mental

resources.

The 1987 Report of the UN World Commission on Environment and Development (usually referred to as the Brundtland Report, after its chairwoman) defined sustainable development as 'development which meets the needs of the present generation without compromising the ability of future generations to meet their own needs' (UN World Commission on Environment and Development 1987). Sustainable development means hand- ing down to future generations not only 'man-made capital' (such as roads, schools and historic buildings) and 'human capital' (such as knowledge and skills), but also 'natural/environmental capital' (such as clean air, fresh water, rainforests, the ozone layer and biological diversity). The Ilrundt- land Report identified the following chief charac- teristics of sustainable development: it maintains the quality of life, it maintains continuing access to natural resources and it avoids lasting environ- mental damage. It means living on the earth's income rather than eroding its capital (DoE et al. 1990). In addition to a concern for the environ- ment and the future, Brundtland also emphasizes participation and equity, thus highlighting both inter- and intra-generational equity. This defini- tion is much wider than ecology and the natural environment; it entails social organization of intra- and inter-generational equity. Importance is also assigned to economic and cultural aspects, such as preventing poverty and social exclusion, concern about the quality of life, attention to ethical aspects of human well being, and systematic organization of participation by all concerned stakeholders.

There is, however, a danger that 'sustainable development' becomes a weak catch-all phrase; there are already many alternative definitions. l lolmberg and Sandbrook (1992) found over 70 definitions of sustainable development. Redclift (1987) saw it as 'moral convictions as a substitute for thought'; to O'Riordan (1988) it was 'a good idea which cannot sensibly be put into practice'. But to Skolimowski (1995), sustainable develop- ment

... struck a middle ground between more radical approaches which denounced all development, and the idea of development conceived as business as usual. The idea of sustainable development, although broad, loose and tinged with ambiguity around its edges, turned out to be palatable to every- body. This may have been its greatest virtue. It is radical and yet not offensive.

Readers are referred to Reid (1995), Kirkby et al. (1995) and Faber ct al. (2005) for an overview of the concept, responses and ongoing debate.

Over time, 'sustainability' has evolved as a partial successor to the term 'sustainable development' (although they can be seen as synonymous), partly because the latter has become somewhat ill used (for example, governments seeking to equate sus- tainable development with sustained growth, firms seeking to equate it with sustained profits).2 How- ever, despite the global acceptance of the 'sustain- ability/sustainable development' concept, its scope and nature are a somewhat contested and confused territory (Faber et al. 2005). There are numerous definitions, but a much-used one is that of the triple bottom line (TBL), reflecting the importance of environmental, social and economic factors in decision-making, although it is important to go beyond that to emphasize the importance of integration and synergies between factors (Figure 1.3); however the assessment of such synergies presents particular challenges. Figure 1.4 empha- sizes that within this three-element definition of sustainability, there is an important hier- archy. The environment and its natural systems are the foundation to any concept of sustain- ability. We cannot survive without the 'goods and services' provided by Earth's natural and physical systems - breathable air, drinkable water and food. Living on Earth, we need social systems to provide social justice, security, cultural identity and a sense of place. Without a well-functioning social system, an economic system cannot be productive.

Institutional responses to sustainable development

Institutional responses to meet the goal of sustainable development are required at several levels. A global response is needed for issues of global concern, such as ozone-layer depletion, climate change, deforestation and biodiversity loss. The United Nations Conference on Environ- ment and Development (UNCED) held in Rio de Janeiro in 1992 was an example not only of international concern, but also of the problems of securing concerted action to deal with such issues. Agenda 21, an 800-page action plan for the international community into the twenty-first century, set out what nations should do to achieve sustainable development. It included topics such as biodiversity, desertification, deforestation, toxic

Figure 1.3

Integrating environmental, social and economic dimensions of sustainability

Figure 1.4

An alternative (hierarchical) perspective on the dimensions of sustainability

wastes, sewage, oceans and the atmosphere. For each of its 115 programmes, the need for action, the objectives and targets to be achieved, the activities to be undertaken, and the means of implementation are all outlined. Agenda 21 offered policies and programmes to achieve a sustainable balance between consumption, population and Earth's life-supporting capacity. Unfortunately it was not legally binding, being dependent on national governments, local governments and others to implement most of the programmes.

The Johannesburg Earth Summit of 2002 re-emphasized the difficulties of achieving inter- national commitment on environmental issues. While there were some positive outcomes - for example, on water and sanitation (with a target to halve the number without basic sanitation - about 1.2 billion - by 2015), on poverty, health, sustainable consumption and on trade and globalization - many other outcomes were much less positive. Delivering the Kyoto Protocol on legally enforceable reductions of greenhouse gases continued to be difficult; the results of the 2009 Copenhagen climate conference fell short of the EU's goal of progress towards the finalization of an ambitious and legally binding global climate treaty to succeed the Kyoto Protocol in 2013 (Wilson and Piper 2010). Similarly, we hear regu- larly of the continuing loss of global biodiversity and of natural resources, and on the challenges of delivering human rights in many countries. All, of course, is now complicated further by the severe challenges and uncertainties of the serious global economic situation. Together, such problems severely hamper progress on sustainable develop- ment.

Within the EU, four Community Action Programmes on the Environment were imple- mented between 1972 and 1992. These gave rise to specific legislation on a wide range of topics, including waste management, the pollution of the atmosphere, the protection of nature and ElA. The Fifth Programme, 'Towards sustainability' (1993-2000), was set in the context of the completion of the Single European Market (CEC I 992). The latter, with its emphasis on major changes in economic development resulting from the removal of all remaining fiscal, material and technological barriers between Member States, could pose additional threats to the environment. The Fifth Programme recognized the need for the clear integration of performance targets - in relation to environmental protection - for several sectors, including manufacturing, energy, transport and tourism. EU policy on the environment would be based on the 'precautionary principle' that preventive action should be taken, that environ- mental damage should be rectified at source and that the polluter should pay. Whereas previous EU programmes relied almost exclusively on legislative instruments, the Fifth Programme advocated a broader mixture, including 'market-based instruments', such as the internalization of environmental costs through the application of fiscal measures, and 'horizontal, supporting instruments', such as improved baseline and statistical data and improved spatial and sectoral planning.

The Sixth Programme, Our f11t11re, our choice (2001-12), built on the broader approach intro- duced in the previous decade. It recognized that sustainable development has social and economic as well as physical environmental dimensions, although the focus is on four main priority issues: tackling climate change, protecting nature and biodiversity, reducing human health impacts from environmental pollution, and ensuring the sustainable management of natural resources and waste. It also recognized the importance of empowering citizens and changing behaviour, and of 'greening land-use planning and management decisions'.

The Community directive on EIA and (the then) proposal on SEA, which aim to ensure that the environmental implications of planned infrastructure projects and planning are properly addressed, will also help ensure that the environmental considerations are better in tegratcd into planning decisions. (CEC 2001)

The EC has not yet decided on the nature of a possible Seventh Programme, including the key role of climate change - either as within the EU environmental policy or as having a more overarching role in the Commission's organiza- tion.

In the UK, the publication of This common inheritance: Britain's environmental strategy (DoE et al. 1990) provided the country's first comprehen- sive White Paper on the environment. The report included a discussion of the greenhouse effect, town and country, pollution control, and aware- ness and organization with regard to environ- mental issues. Throughout it emphasized that responsibility for our environment should be shared between the government, business and the public. The range of policy instruments advocated included legislation, standards, planning and economic measures. The last, building on work by Pearce et al. (1989), included charges,

subsidies, market creation and enforcement incentives. The report also noted, cautiously, the recent addition of EIA to the 'toolbox' of instruments. Subsequent UK government reports, such as Sustainable devel- op111ent: the UK strategy (HMG 1994), recognized the role of ElA in contributing to sustainable development and raised the EIA profile among key user groups. The UK government reports also reflect the extension of the scope of sustainable development to include social, economic and
environmental factors. This is rellected in the UK Strategy for Sustainable Development, A better quality of life (DETR 1999a), with its four objectives of:

1 .4 Projects, environment and impacts

- social progress which recognizes the needs of 1.4. 1 The nature of major projects

everyone;

- effective protection of the environment;
- prudent use of natural resources; and
- maintenance of high and stable levels of economic growth and employment.

To measure progress, the UK government published a set of sustainable development indi- cators, including a set of IS key headline indica- tors (DETR 1999b). It also required a high-level sustainable development framework to be pro- duced for each English region (see, for example, A better quality of" life in the 5011th East, SEERA, 2001).
Planning Policy Statement 1 (PPS!, DCLG 2005) reinforced the commitment to sustainable development. 'Sustainable development is the core principle underpinning planning. At the heart of sustainable development is the simple idea of ensuring a better quality of life for everyone, now and for future generations.' This was further reinforced and developed in an update of the national strategy, Securing the future: delivering the UK sustt1inable development strategy (DEFRA 2005), in which the UK government introduced a revised set of guiding principles, priorities for action and 20 key headline indicators, with a focus on deliv- ery. The guiding principles are:

- living within environmental limits;
- ensuring a strong, healthy and just society;
- achieving a sustainable economy;
- promoting good governance; and
- using sound science responsibly .

The good governance principle adds an import- ant fourth pillar to the other three pillars (environ- mental, social and economic) of sustainable development, shifting from a triple to a quadruple bottom line (QBL) approach. Good governance, at all levels from central government to the indi- vidual, is needed to foster the integration of the three other pillars. Again, EIA can be a useful vehicle for such integration.
As noted in Section 1.2, EIA is relevant to a broad spectrum of development actions, including policies, plans, programmes and projects. The focus here is on projects, reflecting the dominant role of project EIA in practice. The strategic environmental assessment (SEA) and sustainability appraisal (SA) of the 'upper tiers' of development actions are considered further in Chapter 11. The scope of projects covered by EIA is widening, and is discussed further in Chapters 3 and 4.

Traditionally, project EIA has applied to major projects; but what are major projects, and what criteria can be used to identify them? One could take Lord Morley's approach to defining an elephant: it is difficult, but you easily recognize one when you sec it. In a similar vein, the acronym LULU (locally unacceptable land uses) has been applied in the USA to many major projects, such as in energy, transport and manufacturing, clearly reflecting the public perception of the potential negative impacts associated with such develop- ments. There is no easy definition, but it is possible to highlight some important characteristics (see Plate 1.1 and Table 1.2).

Most large projects involve considerable investment. In the UK context, 'megaprojccts' such as the Channel Tunnel and the associated Rail Link, London Heathrow Terminal S, the Olympic 2012 project, motorways (and their widening), nuclear power stations, gas-fired power stations and renewable energy projects (such as major offshore wind farms and the proposed Severn Barrage) constitute one end of the spectrum. At the other end may he industrial estate developments, small stretches of road, and various waste-disposal facilities, with considerably smaller, but still substantial, price tags. Such projects often cover large areas and employ many workers, usually in construction, but also in operation for some projects. They also invariably generate a complex array of inter- and intra-organizational activity during the various stages of their lives. The devel- opments may have wide-ranging, long-term and

1 Kings Cross, London - urban redevelopment

3 Olkiluoto nuclear power plant, Finland

5 Danish offshore wind farm Plate 1.1

'2 Construciion al London '2012 Olympics srle

4 The Oresund Bridge conneciing Sweden and Denmark

Hinkley Point A

6 ES for decommissioning Hinkley Point A, UK

Some examples of major projects Source: Magnox Electric (2002); RPS {2004); Symonds/EDAW {2004); Wikimedia.

Table 1.2 Characteristics of major projects

Substantial capital investment

Cover large areas; employ large numbers (construction and/or operation)

Complex array of organizational links

Wide-ranging impacts (geographical and by type) Significant environmental impacts

Require special procedures

Infrastructure and utilities, extractive and primary (including agriculture); services

Band, point

often very significant impacts on the environ- ment. The definition of significance with regard to environmental effects is an important issue in EIA. It may relate, inter alia, to scale of development, to sensitivity of location and to the nature of adverse and beneficial effects; it will be discussed further in later chapters. Like a large stone thrown into a pond, a major project can create significant ripples, with impacts spreading far and wide. In many respects such projects tend to be regarded as exceptional, requiring special procedures. In the UK, these procedures have included public inquiries, hybrid bills that have to be passed through parliament (for example, for the Channel Tunnel) and EIA procedures. Under the 2008 Planning Act (HMG 2008), a special subset of nationally significant infrastructure projects (NSIPs) has been identified, with impacts to be examined by new procedures led by the Infra- structure Planning Commission (]PC) (to become the National Infrastructure Unit of the UK Planning Inspectorate in 2012). NSll's include major energy projects, transport projects (road, rail and port), water and waste facilities.

Major projects can also be defined according to type of activity. In addition to the infrastructure and utilities, they also include manufacturing and extractive projects, such as petrochemical plants, steelworks, mines and quarries, and services projects, such as leisure developments, out-of-town shopping centres, new settlements and education and health facilities. An EC study adopted a further distinction between band and point infrastruc- tures. Point infrastructure would include, for example, power stations, bridges and harbours; band or linear infrastructure would include electricity transmission lines, roads and canals (CEC 1982).

A major project also has a planning and development life cycle, including a variety of stages. It is important to recognize such stages because impacts can vary considerably between them. The main stages in a project's life cycle are outlined in Figure 1.5. There may be variations in timing between stages, and internal variations within each stage, but there is a broadly common sequence of events. In EIA, an important dis- tinction is between 'before the decision' (stages A and B) and 'after the decision' (stages C, D and E). As noted in Section 1.2, the monitoring and auditing of the implementation of a project following approval are often absent from the EIA process.

Projects are initiated in several ways. Many are responses to market opportunities (e.g. a holiday village, a sub-regional shopping centre, a gas-fired power station; a wind farm); others may be seen as necessities (e.g. the Thames Barrier); others may have an explicit prestige role (e.g. the programme of Grands Travaux in Paris including the Bastille Opera, Musee d'Orsay and Great Arch). Some major projects are public-sector initiatives, but with the move towards privatization in many countries, there has been a move towards private sector funding, exemplified in the UK by such projects as the North Midlands Toll Road, the Channel Tunnel, and now most major utility energy, water and waste projects. The initial planning stage A may take several years, and lead to a specific proposal for a particular site. It is at stage B that the various control and regulatory procedures, including EIA, normally come into play. The con- struction stage can be particularly disruptive, and may last up to 10 years for some projects. Major projects invariably have long operational lives, although extractive projects can be short compared with infrastructure projects. The environmental impact of the eventual closedown/decommission- ing of a facility should not be forgotten; for nuclear power facilities it is a major undertaking. Figure 1.6 shows how the stages in the life cycles of different kinds of project may vary.

Figure 1.5

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Generalized planning and development life cycle for major projects (with particular reference to impact assessment on host area}
Source: Adapted from
Breese el al. 1965

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OS DOWN

The environment can be structured in several ways, including components, scale/space and time. A narrow definition of environmental components would focus primarily on the biophysical environment. For example, the UK Department of the Environment (DoE) used the term to include all media susceptible to pollution, including: air, water and soil; tlora, fauna and human beings; landscape, urban and rural conservation; and the built heritage (DoE 1991). The DoE checklist of environmental components is outlined in Table 1.3. However, as already noted in Section 1.2, the environment has important economic and

socio-cultural dimensions. These include economic structure, labour markets, demography, housing, services (education, health, police, fire, etc.), lifestyles and values; and these are added to the checklist in Table 1.3. This wider definition is more in line with international definitions, as noted by the IAIA definition of EIA in 1.2.1. Similarly, an Australian definition notes, 'For the purposes of EIA, the meaning of environment incorporates physical, biological, cultural, economic and social factors' (ANZECC 1991).

The environment can also be analysed at various scales (Figure 1.7). Many of the spatial impacts of projects affect the local environment, although the nature of 'local' may vary according to the

Figure 1.6 Nuclear
Timescale power Afforestation

(years) station Scheme

Holiday village
Broad variations in life cycle
stages between different types of project
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I A I Planning
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1.4.3
The nature of impacts

Conflict Resolution
I C I Construction
. I) .l Operation
W Close-Down

Gravel Extraction
b I Waste Landfill

Table 1.3 Environmental components

Physical environment Air and atmosphere
Water resources and waler bodies Soil and geology
Flora and fauna Human beings Landscape Cultural heritage Climate
Energy

Socio-economic environment
Demography
Economic base - direct Economic base - indirect Housing; transport; recreation Other local services
Socio-cultural

Air quality
Water quality and quantity
Classification, risks (e.g. erosion, contamination)
Birds, mammals, fish, etc.; aquatic and terrestrial vegetation Physical and mental health and well-being
Characteristics and quality of landscape
Conservation areas; built heritage; historic and archaeological sites; other material assets
Temperature, rainfall, wind, etc.
Light, noise, vibration, etc.

Population structure and trends
Direct employment; labour market characteristics; local and non-local trends Non-basic and services employment; labour supply and demand
Supply and demand
Supply and demand of services: health, education, police, etc. Lifestyles, quality of life; social problems; community stress and conflict
Source: adapted from DoE 1991; DETR 2000; CEC '2003a

local regional national beyond Figure 1.7

Environment: components, scale and lime dimensions aspect of environment under consideration and to the stage in a project's life. However, some impacts are more than local. Traffic noise, for example, may be a local issue, but changes in traffic flows caused by a project may have a regional impact, and the associated CO_2 pollution contributes to the global greenhouse problem. The environment also has a time dimension. Baseline data on the state of the environment are needed at the time a project is being considered. There has been a vast increase in data available on the Internet, from the local to the national level (e.g. in the UK via local authority development plans and national statistical sources, such as the e-Digest of Environ- ment Statistics produced by the Department of Environment, Food and Rural Affairs). For some areas such data may be packaged in tailor-made state-of-the-environment reports and audits. See Chapters 5 and 12, and Appendix 6 for further

guides to data sources. For all data it is important to have a time-series highlighting trends in envir- onmental quality, as the environmental baseline is constantly changing, irrespective of any develop- ment under consideration, and requires a dynamic rather than a static analysis

The environmental impacts of a project are those resultant changes in environmental parameters, in space and time, compared with what would have happened had the project not been under- taken. The parameters may be any of the type of environmental receptors noted previously: air quality, water quality, noise, levels of local unemployment and crime, for example. Figure 1.8 provides a simple illustration of the concept.

environmental parameter

Figure 1.8

The nature of an
II environmental impact

Table 1.4 Types of impact

Physical and socio-economic Direct and indirect
Short-run and long-run
Local and strategic (including regional, national and beyond) Adverse and beneficial
Reversible and irreversible Quantitative and qualitative Distribution by group and/or area
Actual and perceived
Relative to other developments; cumulative

Table 1.4 provides a summary of some of the types of impact that may be encountered in EIA. The biophysical and socio-economic impacts have already been noted. These are sometimes seen as synonymous with adverse and beneficial, respec- tively. Thus, new developments may produce harmful wastes but also produce much needed jobs in areas of high unemployment. However, the correlation does not always apply. A project may bring physical benefits when, for example, previously polluted and derelict land is brought back into productive use; similarly, the socio-economic impacts of a major project on a com- munity could include pressure on local health services and on the local housing market, and increases in community contlict and crime. Projects may also have immediate and direct impacts that give rise to secondary and indirect impacts later. A reservoir based on a river system not only takes land for the immediate body of water but also may have severe downstream implications for flora and fauna and for human activities such as fishing and sailing. The direct and indirect impacts may sometimes correlate with short-run and long-run impacts. For some impacts the distinction between short-run and long-run may also relate to the distinction between a project's construction and its operational stage; however, other construction- stage impacts, such as change in land use, are much more permanent. Impacts also have a spatial dimension. One distinction is between local and strategic, the latter covering impacts on areas beyond the immediate locality. These are often regional, but may sometimes be of national or even international significance. Environmental resources cannot always be replaced; once destroyed, some may be lost forever. The distinction between reversible and irreversible impacts is a very important one, and the irre- versible impacts, not susceptible to mitigation, can constitute particularly significant impacts in an EIA. It may be possible to replace, compensate for or reconstruct a lost resource in some cases, but substitutions are rarely ideal. The loss of a resource may become more serious later, and valuations need to allow for this. Some impacts can be quantified, others are less tangible. The latter should not be ignored. Nor should the distribu- tional impacts of a proposed development be ignored. Impacts do not fall evenly on affected parties and areas. Although a particular project may he assessed as bringing a general benefit, some groups and/or geographical areas may be receiving most of any adverse effects, the main benefits going to others elsewhere. There is also a distinc- tion between actual and perceived impacts. Subjective perceptions of impacts may significantly influence the responses and decisions of people towards a proposed development. They constitute an important source of information, to be con- sidered alongside more objective predictions of impacts.

Social constructions are not mere percep- tions or emotions, to be distinguished from reality; rather, how we view a social situation determines how we behave. furthermore, social constructions of reality are character- istic of all social groups, including the agencies that are attempting to implement change as well as the communities that are affected. (IOCGP 2003)

Finally, all impacts should be compared with the 'do-nothing' situation, and the state of the environment predicted without the project. This can be widened to include comparisons with anticipated impacts from alternative development scenarios for an area. Some projects may also have cumulative impacts in combination with other development actions, current and future; for example, the impacts of several wind farms in an area, or the build-up of several major, but different, developments (e.g. port; power station; steel works; waste water facility) around an estuary. The important area of cumulative impacts is discussed further in Chapters 9 and 12. We conclude on a semantic point: the words 'impact' and 'effect' are widely used in the literature and legislation on F.IA, but it is not always clear whether they arc interchangeable or should be used only for specifically different meanings. In the United States, the regulations for implementing the National Environmental Policy Act (NEPA) expressly state that 'effects and impacts as used in these regulations are synonymous'. This inter- pretation is widespread, and is adopted in this text. But there are other interpretations relating to timing and to value judgements. Catlow and Thirlwall (1976) make a distinction between effects that arc 'the physical and natural changes resulting, directly or indirectly, from development' and impacts that are 'the consequences or end products of those effects represented by attributes of the environment on which we can place an objective or subjective value'. In contrast, an Australian study (CEPA 1994) reverses the arguments, claiming that 'there does seem to be greater logic in thinking of an impact resulting in an effect, rather than the other way round'. Other com- mentators have introduced the concept of value judgement into the differentiation. Preston and Bedford (1988) state that 'the use of the term "impacts" connotes a value judgement'. This view is supported by Stakhiv (1988), who sees a distinc- tion between 'scientific assessment of facts (effects), and the evaluation of the relative importance of these effects by the analyst and the public (impacts)'. rhe debate continues!

EIA

The arguments for EIA vary in time, in space and according to the perspective of those involved. From a minimalist defensive perspective, some developers, and still possibly some parts of some governments, might see EIA as a necessary evil, an administrative exercise, something to be gone through that might result in some minor, often cosmetic, changes to a development that would probably have happened anyway. In contrast, for the 'deep ecologists' or 'deep greens', EIA cannot
provide total certainty about the environmental consequences of development proposals; they feel that any projects carried out under uncertain or risky circumstances should be abandoned. EIA and its methods must straddle such perspectives on weak and strong sustainability. EIA can be, and now often is, seen as a positive process that seeks a harmonious relationship between

development and the environment. The nature and use of EIA will change as relative values and perspectives also change. EIA must adapt, and as O'Riordan (1990) very positively noted over 20 years ago:

One can see that EIA is moving away from being a defensive tool of the kind that dominated the 1970s to a potentially exciting environmental and social betterment tech- nique that may well come to take over the 1990s ... If one secs EIA not so much as a technique, rather as a process that is con- stantly changing in the face of shifting environmental politics and managerial capa- bilities, one can visualize it as a sensitive barometer of environmental values in a com- plex environmental society. Long may EIA thrive.
We conclude on a semantic point: the words
'impact'

are
ongms in a climate of a rational approach to decision-making in the USA in the 1960s (Caldwell 1988). rhe focus was on the systematic process, objectivity, a holistic approach, a consideration of alternatives and an approach often seen as primarily linear. This rational approach is assumed to rely on a scientific process in which facts and logic are pre-eminent. In the UK this rational approach was reflected in planning in the writings of, inter alia, Faludi (1973), Mcloughlin (1969), and Friend and Jessop (1977).
However, other writings on the theoretical context of EIA have recognized the importance of the subjective nature of the EIA process. Kennedy (1988) identified EIA as both a 'science' and an 'art', combining political input and scientific process. More colourfully, Beattie (1995), in an article entitled 'Everything you already know about EIA, but don't often admit', reinforces the point that ElAs are not science; they are often produced under tight deadlines and data gaps, and simplify- ing assumptions are the norm under such con- ditions. They always contain unexamined and unexplained value judgements, and they will always be political. They invariably deal with controversial projects, and they have distributional effects - there are winners and losers. ElA pro- fessionals should therefore not be surprised, or dis- mayed, when their work is selectively used by various parties in the process. Leknes (2001) notes that it is particularly in the later stage of decision- making that the findings of EIA are likely to give way to political considerations. Weston (2003) notes the weakening of deference to science, experts and the rational approach. Confidence in decision-making for major projects is eroded by events such as nuclear accidents, chemical spills, numerous environmental disasters, and massive financial and time overruns of projects (Flyberg 2003). The public increasingly fear the conse- quences of change over which they have little control, and there is more emphasis on risk (see Beck 1992, 2008).
However, in the context of decision-making theory, this recognition of the political, the subjective and value judgement is reflected in a variety of behavioural/participative theories, and is not new. For example, in the 1960s Braybrooke and Lindblom (1963) saw decisions as incre- mental adjustments, with a process that is not
comprehensive, linear and orderly, and is best characterized as 'muddling through'. Lindblom (1980) further developed his ideas through the concept of 'disjointed incrementalism', with a focus on meeting the needs and objectives of society, often politically defined. The importance of identifying and confronting trade-offs, a major issue in EIA, is clearly recognized. The participatory approach includes processes for open communica- tion among all affected parties.
The recognition of multiple parties and the perceived gap between government and citizens has stimulated other theoretical approaches, including communicative and collaborative planning (Healey I 996, 1997). This approach draws upon the work of Habermas (1984), Forester (1989) and others. Much attention is devoted to consensus-building, co-ordination and communication, and the role of government in promoting such actions as a means of dealing with conflicting stakeholder interests and achieving collaborative action. Critics of such an approach highlight in particular the lack of regard for power relationships within society, and especially the role of private sector developers - invariably the proponents in EIA.
It is probably now realistic to place the current evolution of ElA somewhere between the rational and behavioural approaches - reflecting elements of both. It does include important strands of rationalism, but there are many participants, and many decision points - and politics, power rela- tionships and professional judgement are often to the fore. In EIA there are many decisions; for example, on whether EIA is needed at all (screen- ing), the scope of the EIA, the alternatives under consideration, project design and redesign, the range of mitigation and enhancement measures, and implementation and monitoring during the 'post-key-decision' stages of the project life cycle (Glasson 1999). This tends to fit well with the classic concept of 'mixed scanning' advocated by Etzioni (1967), utilizing rational techniques of assessment, in combination with more intuitive value judgements, based upon experience and values. The rational-adaptive approach of Kaiser et al. (1995) also stresses the importance of a series of steps in decision-making, with both (scientific- based) rationality and (community-informed)

participation, moderating the selection of policy options and desired outcomes.
Over the last 40 years, EIA has been joined by a growing family of assessment tools. The IAIA uses the generic term of impact assessment (IA) to encompass the semantic explosion; whereas Sadler (1996) suggested that we should view environ- mental assessment (EA) as 'the generic process that includes EIA of specific projects, SEA of PPPs, and their relationships to a larger set of impact assess- ment and planning-related tools'. Whatever the family name, there is little doubt that member- ship is increasing apace, with a focus on widening the scope, scale and integration of assessment. Impact assessment now includes, for example, SIA, HIA, EqIA, TIA, SEA, SA, S&EIA, HRA/AA, EcIA,
CIA, plus a range of associated techniques such as RA, LCA, MCA, CBA - and many more. Some of the tools have been led by legislation; others have been more driven by practitioners from vari- ous disciplines that have endeavoured to separate out and highlight the theme(s) of importance to their discipline, resulting in thematically focused forms of assessment. Dalal-Clayton and Sadler (2004) rightly observe that 'the alphabet soup of acronyms [and terms] currently makes for a confusing picture'. The various assessment tools are now briefly outlined in terms of scope, scale and integration; most are discussed much further in subsequent chapters.

Scope
Development actions may have impacts not only on the physical environment but also on the social and economic environment. Typically, employment opportunities, services (e.g. health, education), community structures, lifestyles and values may be affected. Socio-ecu11omic impact assessment or social impact assessment (SIA) is regarded in this book as an integral part of EIA. However, in some countries it is (or has been) regarded as a separate process, sometimes paral- lel to EIA, and the reader should be aware of its separate existence (Carley and Bustelo 1984; Finsterbusch 1985; IAIA 1994; Vanclay 2003). Some domains explicitly use S&EIA to denote Socio-economic and environmental impact assess- ment. Health impact assessment (HIA) has been a particularly important area of growth in recent years, evolving out of the socio-economic strand; its focus is on the effects that a development action may have on the health of its host population (!PHI 2009). A more recent area still is equality impact assessment (EqIA), which seeks to identify the important distributional impacts of development actions on various groups in society (e.g. by gender, race, age, disability, sexual orienta- tion etc., Downey 2005). Vanclay and Bronstein (1995) and others note several other relevant definitions, based largely on particular foci of specialization and including, for example, transport impact assessment, demographic impact assess- ment, climate impact assessment, gender impact assessment, psychological impact assessment, noise impact assessment, economic impact assessment, and cumulative impacts assessment (Canter and Ross 2010).

EIA in
to strategic assessment, seeking to include bio- physical and socio-economic impacts, is provided by SA. In England this is required for the assess- ment of the impacts of plans under the T&CP system. In some domains, where there is not a strat- egic level of assessment or planning, project-level assessment may adopt, to varying degrees, a strat- egic perspective, with features of either SEA or SA; good examples are provided by mega-projects, such as the major mineral development projects in the remote areas of Australia.

Integration
Hacking and Guthrie (2008) have sought to provide a relational framework (Figure 1.9) to clarify the position of various assessment tools, in the con- text of planning and decision-making for sustain- able development. In addition to scope (referred to as comprehensiveness of coverage) and scale (strategicness of the focus and scope), they also
include integratedness of techniques and themes. The latter includes a package of techniques that seek to achieve integration in the assessment process (e.g. between biophysical and socio-economic impacts; Scrase and Sheatc 2002); this was termed 'horizontal integration' by Lee (2002). Petts (1999) provides a good overview of some of the techniques that include, for example, life cycle assessment (LCA), cost-benefit analysis (CBA), enviru11me11tal auditing, multi-criteria assessment (MCA) and risk assessment (RA). LCA differs from EIA in its focus not on a particular site or facility, but on a product or system and the cradle-to-grave environmental effects of that product or system (see White et al. 1995). In contrast, CBA focuses on the economic impacts of a development, but taking a wide and long view of those impacts. It involves as far as possible the monetization of all the costs and benefits of a proposal. It came to the fore in the UK in relation to major transport projects in the 1960s, but has subsequently enjoyed

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COMPREHENSIVENESS
of the coverage

Figure 1.9

A relational framework of SD-focused assessment tools Source: Hacking and Guthrie 2008
a new lease of life (see Hanley and Splash 1993; Lichfield 1996). Environmental auditing is the systematic, periodic and documented evaluation of the environmental performance of facility operations and practices, and this area has seen the development of procedures, such as the inter- national standard ISO 14001.

Multi-criteria decision assessment (MCDA) covers
a collection of approaches, often quantitative, that can be used to help key stakeholders to explore alternative approaches to important decisions by explicitly taking account of multiple criteria (Helton and Stewart 2002); it is quite widely used. Risk assessment is another term sometimes found associated with EIA. Partly in response to events such as the chemicals factory explosion at Flix- borough (UK), and nuclear power station acci- dents at Three Mile Island (USA) and Chernobyl (Ukraine), RA developed as an approach to the analysis of risks associated with various types of development. Calow (1997) gives an overview of the growing area of environmental RA and man- agement, and Flyberg (2003) provides a critique of risk assessment in practice. While these tools tend to be more technocentric, they can be seen as complementary to EIA, seeking to achieve a more integrated approach. Thus Chapter 5 explores the potential role of CBA and MCA approaches in EIA evaluation; Chapter 12 develops further the concept of integrated assessment, and explores the role of environmental auditing and LCA in relation to environmental management systems (EMSs).

This brief discussion on changing perspectives,
on the theoretical context, associated tools and processes, emphasizes the need to continually re- assess the role and operation of EIA and the importance of an adaptive EIA. This will be developed further in several chapters - especially in Part 4.

Although EIA now has over 40 years of history in the USA, elsewhere the development of concepts and practice is more recent. Development is moving apace in many other countries, including the UK and the other EU Member States. There is
much to welcome; Gibson (2002) noted some worldwide trends in ElA, such as that it is earlier in the process, more open and participative, more comprehensive (not just biophysical environ- ment), more mandatory, more closely monitored, more widely applied (e.g. at various levels), more integrative, more ambitious (regarding sustain- ability objectives) and more humble (recognizing uncertainties, applying precaution). Yet such pro- gress is variable, and has not been without its problems. A number of the current issues in EIA are highlighted here and will be discussed more fully in later chapters.
a new

systematic, periodic
One assessment of quality is that of the immediate output of the process, the EIS. Many EISs may fail to meet even minimum standards. For example, an early survey by Jones et al. (1991) of the EISs published under UK EIA regulations highlighted some shortcomings. They found

... that one-third of the EISs did not appear to contain the required non-technical summary, that, in a quarter of the cases, they were judged not to contain the data needed to assess the likely environmental effects of the development, and that in the great majority of cases, the more complex, inter- active impacts were neglected.

The DoE (1996) later suggested that although there had been some learning from experience, many ElSs in the UK were still unsatisfactory (see Chapter 8 for further and updated discussion). Quality may vary between types of project. It may also vary between countries supposedly operating under the same legislative framework.
EISs can run the risk of being voluminous, un- integrated, documents that can be difficult for most of the participants in the EIA process. Such outcomes raise various questions about the efficiency of the EIA process. For example, are 'safety first' policies resulting in too many projects being screened for EIJ\ and the EIJ\ scoping stage being too all embracing of potential impacts? ls there too much focus on over-descriptive baseline work and not enough focus on the key impacts that matter? Is the EIS still a set of segregated specialist chapters rather than a well-integrated document? Are the key steps of monitoring and auditing well enough built into the process? Considerations of efficiency, however, can also run counter to considerations of fairness in the process.

The various 'actors' in the ElA process - the developer, the affected parties, the general public and the regulators at various levels of government

The

and
procedural/narrow approach would focus on how well EIA is being carried out according to its own procedural requirements in the country of concern; a procedural/wider approach might consider the extent to which EIA is contributing to increased environmental awareness and learning among the array of key stakeholders. These dimensions are partly covered in the preceding sections (1.6.1- 1.6.3). However, more fundamental, in relation to EIA core purposes, are substantive approaches. For example, a substantive/narrow approach would concentrate on whether EIA is having a direct impact on the quality of planning decisions and the nature of developments. A substantive/ wider approach would focus on the fundamental question of whether EIA is maintaining, restor- ing, and enhancing environmental quality; is it contributing towards more sustainable develop- ment? These issues of EIA effectiveness are exam- ined in various sections, and particularly in Chapter 8.

Many EISs are for one-off projects, and there may be little incentive for developers to audit the quality of the assessment predictions and to monitor impacts as an input to a better assessment for the next project. Yet EIA up to and no further than the decision on a project is a very partial exercise. It is important to ensure that the required mitigation and enhancement measures arc implemented in practice. In some areas of the world (e.g. California, Western Australia, the Netherlands, and Hong Kong to mention just a few), the monitoring of impacts is mandatory, and monitoring procedures must be included in an EIS. It is also important to take the opportunity for a cyclical learning process, auditing predicted outcomes as fully as possible - to check the accuracy of predictions. The relationship with environmental management processes is another vital area of concern; EISs can effectively lead to environmental management plans for project implementation - but, again, good practice is patchy. The extension of such approaches con- stitutes another significant current issue in the project-based EIA process.
As noted in Section 1.5, the IA family has grown apace, especially in recent years. How can this complexity be managed? For example, what should be the norm for the content of a contemporary EIS? There is a strong case for widening the dimensions of the environment under consideration to include socio-economic impacts more fully. The trade-off between the often adverse biophysical impacts of a development and the often beneficial socio- economic impacts can constitute the crucial dilemma for decision-makers. Coverage can also be widened to include other types of impacts only very partially covered to date. Should the EIS include social, health and equality elements as standard, or should these be separate activities, and documents? In a similar vein, which projects should have EIAs? For example, project EIA may be mandatory only for a limited set of major projects, but in practice many others may be included. Case law is now building up in many countries, but the criteria for the inclusion or exclusion of a

project for EIA may not always be clear.

As also noted in Section 1.5, the SEA/SA of PPPs represents a logical extension of project assessment. SEA/SA can cope better with cumulative impacts, alternatives and mitigation measures than pro- ject assessment. But what is the nature of the relationship between the different scales of impact assessment? Strategic levels of assessment of plans and programmes should provide useful frameworks for the more site-specific project assessments, hopefully reducing workload and leading to more concise and effective EIAs. But the anticipated tiered relationship may be more in theory than practice, leading to unnecessary and wasteful duplication of activity.

procedural/narrow

own

Following from this first chapter, which provides an introduction to EIA and an overview of principles, Chapter 2 focuses on the origins of EIA under the US NEPA of 1969, on interim develop- ments in the UK, and on the subsequent introduc- tion of EC Directive 85/337 and subsequent amendments and developments. The details of the UK legislative framework for EIA, under T&CP and other legislation are discussed in Chapter 3.

Part 2 provides a rigorous step-by-step approach to the EIA process. This is the core of the text. Chapter 4 covers the early start-up stages, estab- lishing a management framework, clarifying the type of developments for EIA, and outlining approaches to scoping, the consideration of alternatives, project description, establishing the baseline and identifying impacts. Chapter S explores the central issues of prediction, the assessment of significance and impact mitigation and enhancement. The approach draws out broad principles affecting prediction exercises, exemplified with reference to particular cases. Chapter 6 provides coverage of an important issue identified above: participation in the ElA process. Communication in the EIA process, EIS presenta- tion and EIA review are also covered in this chapter. Chapter 7 takes the process beyond the decision on a project and examines the importance of, and approaches to, monitoring and auditing in the EIA process.

Part 3 exemplifies the process in practice. Chapter 8 provides an overview of UK practice to date, including quantitative and qualitative analyses of the E!Ss prepared. Chapter 9 provides a review of EIA practice in several key sectors, including energy, transport, waste management and tourism. A feature of the chapter is the
provision of a set of case studies of recent and topical EIA studies from the UK and overseas, illustrating particular features of and issues in the EIA process. Chapter 10 draws on comparative experience from developed countries (e.g. Canada and Australia) and from a number of countries from the developing and emerging economies (Peru, China, Benin and Poland) - presented to highlight some of the strengths and weaknesses of other systems in practice. The important role of international agencies in EIA practice - such as the European Bank for Reconstruction and Develop- ment and the World Bank - is also discussed in this chapter.

Part 4 looks to the future; it illuminates many of the issues noted in Section 1.6. The penultimate chapter discusses the need for SEA and some of its limitations. It reviews the status of SEA in the USA, European Union and UNECE, and China. It then discusses in more detail how the European SEA Directive is being implemented in the UK. Chapter 12, the final chapter, focuses on improving the effectiveness of, and the prospects for, project- based EIA. It considers the array of perspectives on change from the various participants in the EIA process, followed by a consideration of possible developments in some important areas of the EIA process and in the nature of EISs. The chapter concludes with a discussion of the parallel and complementary development of environmental management systems and audits. Together, these topics act as a kind of action list for future improvements to EIA. A set of appendices provide details of legislation and practice, and websites and journals not considered appropriate to the main text.

SOME QUESTIONS

The following questions are intended to help the reader focus on the important issues of this chapter, and to start building some understanding of the principles of EIA.

1
Revisit the definitions of EIA given in this chapter. Which one do you prefer and why?

2
Some steps in the EIA process have proved to be more difficult to implement than others. From your initial reading, identify which these might be and consider why they might have proved to be problematic.

3
Taking a few recent examples of environmental impact statements for projects in your country, review their structure and content against the outline information in this chapter. Do they raise any issues on structure and content?

4
What are the differences between (i) project screening and project scoping, and (ii) impact mitigation and impact enhancement?

5
Review the purposes for EIA, and assess their importance from your own perspective.

6
Apply the characteristics of major projects set out in Table 1.2 to two major projects with which you are familiar. Are there any important variations between the applications? If so, can you explain why?

7
Similarly, for one of the projects identified in Q6, plot the likely stages in its life cycle - applying approximate timings as far as possible.

8
What do you understand by a multi-dimensional approach to the environment, in EIA?

9
What is an impact in EIA? Do you see any difference between impacts and effects?

10
What do you understand by (i) irreversible impacts, (ii) cumulative impacts and (iii) distributional impacts, in EIA?

11
Why should it be important to adopt an adaptive approach to EIA?

12
This question may be a little deep at this stage of your reading, but we will ask it all the same: do you think it is reasonable to consider the EIA process as a rational, linear scientific process?

13
What are the main differences between EIA and SEA?

14
What might be some of the reasons for the widening scope of EIA?

15
What do you understand by 'beyond the decision' in EIA?

16
How might we measure (i) the efficiency, and (ii) the effectiveness of EIA?

Notes

In some domains the EIS is referred to more simply as an ES; these terms are used interchangeably in this book.

2 Turner and Pearce (1992) and Pearce (1992) have drawn attention to alternative interpretations of maintaining the capital stock. A policy of conserving the whole capital stock (man-made, human and natural) is consistent with running down any part of it as long as there is substitutability between capital degradation in one area and investment in another. This can be interpreted as a 'weak sustainability' position. In contrast, a 'strong sustainability' position would argue that it is not acceptable to run down environmental assets, for several reasons: uncertainty (we do not know the full consequences for human beings). irreversibility (lost species cannot be replaced), life support (some ecological assets serve life-support functions) and loss aversion (people are highly averse to environmental losses). The 'strong sustainability' position has much to commend it, but institutional responses have varied.

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2 Origins and development

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Environmental impact assessment was first formally established in the USA in 1969 and has since spread, in various forms, to most other countries. In the UK, EIA was initially an ad hoc procedure carried out by local planning authorities and developers, primarily for oil- and gas-related developments. A 1985 European Community directive on EIA (Directive 85/337) introduced broadly uniform requirements for EIA to all EU Member States and significantly affected the development of EIA in the UK. However, 10 years after the Directive was agreed, Member States were still carrying out widely diverse forms of EIA, contradicting the Directive's aim of 'levelling the playing field'. Amendments of 1997, 2003 and 2009 aimed to improve this situation. The nature of EIA systems (e.g. mandatory or discretionary, level of public participation, types of action requir- ing EIA) and their implementation in practice vary widely from country to country. However, the rapid spread of the concept of EIA and its central role in many countries' programmes of environ- mental protection attest to its universal validity as a proactive planning tool.
This chapter first discusses how the system of EIA evolved in the USA. The present status of EIA worldwide is then briefly reviewed (Chapter 10 will consider a number of countries' systems of EIA
in greater depth). £IA in the UK and the EU are then discussed. Finally, we review the various systems of EIA in the EU Member States.

The US National Environmental Policy Act of 1969, also known as NEPA, grew out of increasing concern in the USA about widespread examples of environmental damage, vividly highlighted in the I960s by the books Silent Sprins (Carson 1962) and The Population Romb (Ehrlich 1968). NEPA was the first legislation to require EIAs. Consequently it has become an important model for other
2

Origins

litigation over the interpretation and workings of the EIA system.
!"his section covers NEPA's legislative history (i.e. the early development before it became law), the interpretation of NEPA by the courts and the Council on Environmental Quality (CEQ), the main EIA procedures arising from NEPA, and likely future developments. The reader is referred to Anderson et al. (1984), Bear (1990), Canter (1996), CEQ (1997a), CRS (2006), Greenberg
(2012), Mandelker (2000), Orloff (1980) and the annual reports of the CEQ for further information.

The National Environmental Policy Act is in many ways a fluke, strengthened by amendments that should have weakened it, and interpreted by the courts to have powers that were not originally intended. The legislative history of NEPA is interest- ing not only in itself but also because it explains many of the anomalies of its operation and touches on some of the major issues involved in design- ing an EIA system. Several proposals to establish a national environmental policy were discussed in the US Senate and House of Representatives in the early 1960s. All these proposals included some form of unified environmental policy and the establishment of a high-level committee to foster it. In February 1969, Bill Sl075 was introduced in the Senate; it proposed a programme of federally funded ecological research and the establish- ment of a CEQ. A similar bill, HR6750, intro- duced in the House of Representatives, proposed the formation of a CEQ and a brief statement on national environmental policy. Subsequent discus- sions in both chambers of Congress focused on several points:

- The need for a declaration of national environ- mental policy (now Title I of NEPA).

- A proposed statement that 'each person has a fundamental and inalienable right to a 2.2.2
An interpretation of NEPA

Improvement Act, which would require federal officials to prepare a detailed statement concerning the probable environmental impacts of any major action; this was to evolve into NEPA's §102(2)(C), which requires EIA. The initial wording of the Bill had required a 'finding', which would have been subject to review by those responsible for environmental protection, rather than a 'detailed statement' subject to inter-agency review. The Senate had intended to weaken the Bill by requiring only a detailed statement. Instead, the 'detailed assessment' became the subject of external review and challenge; the public availability of the detailed statements became a major force shaping the law's implementation in its early years. NEPA became operational on 1 January 1970. Table 2.1 summarizes its main points.

The National Environmental Policy Act is a generally worded law that required substantial early interpretation. The CEQ, which was set up by NEPA, prepared guidelines to assist in the Act's interpretation. However, much of the strength of NEPA came from early court rulings. NEPA was immediately seen by environmental activists as a significant vehicle for preventing environmental harm, and the early 1970s saw a series of influential lawsuits and court decisions based on it. These lawsuits were of three broad types, as described by Orloff (1980):

Challenging an agency's decision not to prepare an EIA. This generally raised issues such as whether a project was major, federal, an 'action', or had significant environmental impacts (sec NEPA §102(2)(C)). For instance, the issue of whether an action is federal came into question in some lawsuits concerning the federal funding of local government projects.1
healthful environment' (which would put 2 environmental health on a par with, say, free speech). This was later weakened to the state- ment in §1Ol(c) that 'each person should enjoy a healthful environment'.
litigation over the interpretation and workings of
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Table 2 .1 Main points of NEPA

NEPA consists of two titles. Title I establishes a national policy on the protection and restoration of environmental quality. Title II set up a three-member CEO to review environmental programmes and progress, and to advise the president on these matters. II also requires the president to submit an annual 'Environmental Oualіty Report' lo Congress. The provisions of Ti e I are the main determinants of EIA in the USA, and they are summarized here.

Section 101 contains requirements of a substantive nature. It slates that the federal government has a continuing responsibility to 'create and maintain conditions under which man and nature can exist in productive harmony, and fulfil the social, economic and other requirements of present and future generations of Americans'. As such the government is to use all practicable means, 'consistent with other esseniial considerations of national policy', to minimize adverse environmental impact and to preserve and enhance the environment through federal plans and programmes. Finally, 'each person should enjoy a healthful environment', and citizens have a responsibility to preserve the environment.

Section 102 requirements are of a procedural nature. Federal agencies are required to make full analyses of all the environmental effects of implementing their programmes or actions. Section 102(1) directs agencies to interpret and administer policies, regulations and laws in accordance with the policies of NEPA Section 102(2) requires federal agencies

- To use 'a systematic and interdisciplinary approach' to ensure that social, natural and environmental sciences are used in planning and decision-making.

To identify and develop procedures and methods so that 'presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with traditional economic and technical considerations'.

- To 'include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official' on: •
  - the environmental impact of the proposed action;
  - any adverse environmental eHecis that cannot be avoided should the proposal be implemented;
  - alternatives to the proposed action;

•
the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity;

any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be
implemented. [Emphasis added]

Section 103 requires federal agencies to review their regulations and procedures for adherence to NEPA. and to suggest any necessary remedial measures.

the Atomic Energy Commission did not adequately consider the water quality impacts of its proposed nuclear power plants, par- ticularly in the EIA for the Calvert Cliffs power plant.2 The Commission argued that NEPA merely required the consideration of water quality standards; opponents argued that it required an assessment beyond mere compli- ance with standards. The courts sided with the opponents.
3
Challenging an agency's substantive decision, namely its decision to allow or not to allow a project to proceed in the light of the contents of its EIS. Another influential early court ruling laid down guidelines for the judicial review of agency decisions, noting that the court's only function was to ensure that the agency had taken a 'hard look' at environmental
3.1.1
A summary of NEPA procedures

consequences, not to substitute its judgement for that of the agency.3

The early proactive role of the courts greatly strengthened the power of environmental move- ments and caused many projects to be stopped or substantially amended. In many cases the lawsuits delayed construction for long enough to make them economically unfeasible or to allow the areas where projects would have been sited to be designated as national parks or wildlife areas (Turner 1988). More recent decisions have been less clearly pro-environment than the earliest decisions. The flood of early lawsuits, with the delays and costs involved, was a lesson to other countries in how not to set up an EIA system. As will be shown later, many countries carefully distanced their EIA systems from the possibility of lawsuits.
The CEQ was also instrumental in establishing guidelines to interpret NEPA, producing interim guidelines in 1970, and guidelines in 1971 and 1973. Generally the courts adhered closely to these guidelines when making their rulings. However, the guidelines were problematic: they were not detailed enough, and were interpreted by the federal agencies as being discretionary rather than binding. To combat these limitations, President Carter issued Executive Order 11992 in 1977, giving the CEQ authority to set enforceable regulations for implementing NEPA. These were issued in 1978 (CEQ 1978) and sought to make the NEPA process more useful for decision-makers and the public, to reduce paperwork and delay and to emphasize real environmental issues and alternatives.

The process of EIA established by NEPA, and developed further in the CEQ regulations, is summarized in Figure 2.1. The following citations are from the CEQ regulations (CEQ 1978).

[The Eli\ process begins) as close as possible to the time the agency is developing or is presented with a proposal ... The statement shall be prepared early enough so that it can serve practically as an important contribution to the decision-making process and will not be used to rationalize or justify decisions already made. (§1502.5)

A 'lead agency' is designated that co-ordinates the EIA process. The lead agency first determines whether the proposal requires the preparation of a full EIS, no EIS at all, or a 'finding of no significant impact' (FONSI). This is done through a series of tests. A first test is whether a federal action is likely to individually or cumulatively have a significant

environmental impact. All federal agencies have compiled lists of 'categorical exclusions' that are felt not to have such impacts. If an action is on such a list, then no further EIA action is generally needed. If an action is not categorically excluded, an 'environmental assessment' is carried out to determine whether a full EIS or a FONS! is needed. A FONS[is a public document that explains why the action is not expected to have a significant environmental impact.
If a FONS! is prepared, then a permit would usually be granted following public discussion. If a full EIS is found to be needed, the lead agency publishes a 'Notice of intent', and the process of scoping begins. The aim of the scoping exercise is to determine the issues to be addressed in the EIA: to eliminate insignificant issues, focus on those that are significant and identify alternatives to be addressed. The lead agency invites the participation of the proponent of the action, affected parties and other interested persons.

[The alternatives) section is the heart of the environmental impact statement ... [It) should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice
... (§1502.14)

The agency must analyse the full range of direct, indirect and cumulative effects of the preferred alternative, if any, and of the reasonable alterna- tives identified in the process. For the purpose of NEPA, 'effects' and 'impacts' mean the same thing, and include ecological, aesthetic, historic, cultural, economic, social or health impacts, whether adverse or beneficial.
A draft EIS is then prepared, and is reviewed and commented on by the relevant agencies and the public. These comments are taken into account in the subsequent preparation of a final EIS. J\n EIS is normally presented in the format shown in rable
2.2. In an attempt to be comprehensive, early E!Ss tended to be so bulky as to be virtually unreadable. The CEQ guidelines consequently emphasize the need to concentrate only on important issues and to prepare readable documents: 'The text of final environmental impact statements shall normally be less than 150 pages ... Environmental impact statements shall be written in plain language ... ' (§1502.7-8)
The public is involved in this process, both at the scoping stage and after publication of the draft and final EISs:

Agencies shall: (a) Make diligent efforts to involve the public in preparing and imple- menting :s.lEPA procedures ... (b) Provide public notice of :NEPA-related hearings, public

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Figure 2.1

Process of EIA under NEPA Source: CEO 2007

Table 2.2 Typical format for an EIS under NEPA

(a)
Cover sheet

list of responsible agencies title of proposed action contact persons at agencies
designation of EIS as draft, final or supplement abstract of EIS
date by which comments must be received

(b)
Summary (usually 15 pages or less) major conclusions

areas of controversy issues lo be resolved

(c)
Table of contents

(d)
Purpose of and need for action

(e)
Alternatives, including proposed action

(f)
Affected environment

(g)
Environmental consequences

•
environmental impacts of alternatives, including proposed action

adverse environmental effects that cannot be avoided if proposal is implemented
mitigation measures to be used and residual effects of mitigation
relation between short-term uses of the environment and maintenance and enhancement of long-term productivity irreversible or irretrievable commitments of resources if proposal is implemented
discussion of:
direct, indirect and cumulative effects and their significance
possible conflicts between proposed action and objectives of relevant land-use plans, policies and controls
effects of alternatives, including proposed action energy requirements and conservation potential of various alternatives and mitigation measures natural or depletable resource requirements and conservation of various alternatives and mitigation measures
effects on urban quality, historic and cultural resources, and built environment
means to mitigate adverse impacts

(h)
Monitoring arrangements, and environmental management system

(i)
List of preparers

G) List of agencies, etc. to which copies of EIS are sent

(k)
Index (I)
Appendices, including supporting data

3.1.2
Recent trends

meetings and the availability of environ- mental documents ... (c) Hold or sponsor public hearings ... whenever appropriate
... (d) Solicit appropriate information from the public. (e) Explain in its procedures where interested persons can get information or status reports ... (f) Make environmental impact statements, the comments received, and any underlying documents available to the public pursuant to the provisions of the Freedom of Information Act ... (§1506.6)

Finally, a decision is made about whether the proposed action should be permitted:

Agencies shall adopt procedures to ensure that decisions are made in accordance with the policies and purposes of the Act. Such procedures shall include but not be limited to: (a) Implementing procedures under sec- tion 102(2) to achieve the requirements of sections 101 and 102(1) ... (e) Requiring that
... the decision-maker consider the alterna- tives described in the environmental impact statement. (§1505.1)

Where all relevant agencies agree that the action should not go ahead, permission is denied, and a judicial resolution may be attempted. Where agencies agree that the action can proceed, permission is given, possibly subject to specified conditions (e.g. monitoring, mitigation). Where the relevant agencies disagree, the CEQ acts as arbiter (§1504). Until a decision is made, 'no action concerning the proposals shall be taken which could: (1) have an adverse environmental impact; or (2) limit the choice of reasonable alternatives
... '(§1506.1).
The Record of Decision (ROD) is the final step for agencies in the process. It states what the

decision is; identifies the alternatives considered, including the environmentally preferred alterna- tive; and discusses mitigation plans, including any enforcement and monitoring commitments. It also discusses if all practical means to avoid or minimize environmental harm have been adopted and, if not, why they were not. It is a publicly available document published in the Federal Register or on the website of the relevant agency.

EIS activity

During the first 10 years of NEPA's implemen- tation, about 1,500 EISs were prepared annually. Subsequently, negotiated improvements to the environmental impacts of proposed actions have become increasingly common during the prepara- tion of 'environmental assessments' (EA). This has led to many 'mitigated findings of no significant impact' (no perfect acronym exists for this), reducing the number of ElSs prepared: whereas 1,273 EISs were prepared in 1979, only 456 were prepared in 1991 and the annual number has been approximately 500-550 in recent years (NEPA website). This trend can be viewed positively, since it means that environmental impacts are considered earlier in the decision-making pro- cess, and hence it reduces the costs of preparing EISs. However, the fact that this abbreviated pro- cess allows less public participation causes some concern. Table 2.3 summarizes activity for 2008, indicating the predominance of EISs filed by the Department of Agriculture (primarily for forestry projects) and the Department of Transportation
(primarily for road construction). Between 1979 and 2008, the number of EISs filed by the Depart- ment of Housing and Urban Development fell from 170 to 0! The number of legal cases filed against federal departments and agencies on the basis of NEPA has been on average 100-150 per annum. Plaintiffs are mainly public interest groups and individual citizens; common complaints are 'no EIS when one should have been prepared' and 'inadequate EIS'.

It is important to set this EIS activity in con- text. Important though they are, including some of the projects with the greatest impacts and highest stakeholder interest, the EISs represent only the tip of the iceberg of the wider EA activity. By comparison, in 1997 CEQ reported that federal agencies in total estimated that approximately 50,000 EAs were produced annually (CEQ 1997a). Determining the total number of federal actions subject to NEPA is difficult, but one agency, the Federal Highway Administration (FHWA), has tracked all projects. In 2001, FHWA estimated that 3 per cent of projects required an EIS, 7 per cent required an EA, and 90 per cent of all high- way projects were classified as categorical exclusions.

Table 2.3 EISs filed under NEPA in 2008

Department Number of EISs filed Of which

Agriculture Commerce Defense Energy
Health and human services
128 Forest Service: 124
36 National Oceanic and Atmospheric Admin: 36
79 Corp of Engineers: 42; Navy: 24
36 Federal Energy Regulatory Commission: 19
Homeland security
Housing and urban development Interior
Justice Labor State
Transportation Treasury Veteran aHairs

Independent agency TOTAL
8
0
128
2
0
3
104
0
0
25

US Coast Guard: 6

Bureau of Land Management: 48; National Parks Service: 25

Federal Highway Admin: 64

Nuclear Regulatory Commission: 14
Source: NEPA website
System review
The National Environmental Policy Act's twentieth year of operation, 1990, was marked by a series of conferences on the Act and the presentation to Congress of a bill of NEPA amendments. Under the Bill (HRl 113), which was not passed, federal actions that take place outside the USA (e.g. projects built in other countries with US federal assistance) would have been subject to EIA, and all EISs would have been required to consider global climatic change, the depletion of the ozone layer, the loss of biological diversity and transboundary pollution. This latter amendment was controversial: although the need to consider the global impacts of programmes was undisputed, it was felt to be infeasible at the level of project EIA.
The context of EIA has also become a matter of concern. EIA is only one part of a broader environmental policy (NEPA), but the procedural provisions set out in NEPA's 102(2)(C) have overshadowed the rest of the Act. It has been argued that mere compliance with these procedures is not enough, and that greater emphasis should be given to the environmental goals and policies stated in §101. EIA must also be seen in the light of other environmental legislation. In the USA, many laws dealing with specific aspects of the environment were enacted or strengthened in the 1970s, including the Clean Water Act and the Clean Air Act. These laws have in many ways superseded NEPA's substantive requirements and have complemented and buttressed its procedural requirements. Compliance with these laws does not necessarily imply compliance with NEPA. I lowever, the permit process associated with these other laws has become a primary method for evaluating project impacts, reducing NEPA's importance except for its occasional role as a focus of debate on major projects (Bear 1990).
The scope of EIA, and in particular the recog- nition of the social dimension of the environ- ment, has been another matter of concern. After long campaigning by black and ethnic groups, particularly about inequalities in the distribu- tion of hazardous waste landfills and incinerators, a working group was set up within the Environ- mental Protection Act (EPA) to make recommen- dations for dealing with environmental injustice
(Hall 1994). The outcome was the Clinton 'Execu- tive Order on Federal Actions to Address Envir- onmental Justice in Minority Populations and Low-Income Populations' (White House 1994). Under this Order, each federal agency must analyse the environmental effects, including human health, economic and social effects, of federal actions, including effects on minority and low- income communities, when such analysis is required under NEPA. Mitigation measures, wher- ever feasible, should also address the significant and adverse environmental effects of federal actions on the same communities. In addition, each federal agency must provide opportunities for communities to contribute to the NEPA process, identifying potential effects and mitigation meas- ures in consultation with affected communities and improving the accessibility of meetings and crucial documents.
Discussion of issues, NEPA effectiveness, and amendments to the EA process, has continued to date. Canter (1996) highlighted four areas for which NEPA requirements needed further elaboration:

how much an agency should identify and plan mitigation before issuing an EIS;
2
ways to assess the cumulative impacts of proposed developments;

3
ways to conduct 'reasonable foreseeability' (or worst-case) analyses; and

4
monitoring and auditing of impact predic- tions. 3.1.3
Little NEPAs and the particular case of California

In 1997 CEQ carried out a review of the effectiveness of NEPA after 25 years. Overall the view was that NEPA had been a success:

... it had made agencies take a hard look at the environmental consequences of their actions, and it had brought the public into the agency decision-making process like no other statute. In a piece of legislation barely three pages long, NEPA gave a voice to the new national consensus to protect and improve the environment, and substance to the determination articulated by many to work together to achieve that goal. (CEQ 1997a)
But there was concern about several features: a focus on the documentation, rather than on the enhancement of decision making; an associated focus on litigation-proof documentation; consultation that was too late in the process; and an overlong process. Some recommendations for the future included better interagency co-ordination; and better monitoring and adaptive management. There was also a concern for a more integrated interdisciplinary place-based approach bringing together expertise and information from many fields, as illustrated in the example in Box 2.1. l'here has been progress in a number of areas, including the consideration of: cumulative impacts, the relationship between the EIS and environmental management systems (EMS), and approaches to the 'streamlining' of the overall system. Although the original NEPA does define the nature of cumulative impacts, agencies have been left very much to their own devices to develop relevant procedures and methods. However, in 1997 (non-legally binding) guidance for the con- sideration of cumulative effects assessment under the NEPA was provided by the Council for Environmental Quality. The CEQ handbook pre- sents practical methods for addressing coincident effects (adverse or beneficial) on specific resources, ecosystems, and human communities of all related activities, not just the proposed project or alterna- tives that initiate the assessment process (CEQ
1997b). Although NEPA affirms a 'predict-mitigate- implement' model, there can be major weaknesses in the implementation stage. The issuance of an Executive Order (Exec. Order 13423, January 2007), which directs all Federal agencies to implement EMSs at all organizational levels, helps to address this issue, providing a means to enhance EIS compliance. CEQ has again issued relevant guid- ance, on Aligning NEPA Processes with Environmental Management Systems (CEQ 2007). There is also a general and ongoing concern about the time con- sumed by the NEPA processes, accompanied by calls for more 'streamlining'. A Congressional Research Service report identified two main categories of delay attributed to the NEPA process: those related to the time needed to complete the required docu- mentation (primarily the EISs), and delays resulting from NEPA-related litigation (CRS 2006). The report discusses a range of responses, including limits on the length of ElSs, establishing limits on judicial review, updating lists of Categorically Excluded and Exempt projects, and many others, some of which have been implemented while others are still subject to debate!

Many state-level ElA systems have been established in the USA in addition to NEPA. Fifteen of the

Branson, Missouri is one of the hottest entertainment centers in the country, receiving more than 3. 7 million visitors during the six month tourist season in 1991. At peak times, 30,000 cars are jammed onto Country Music Boulevard each day, resulting in average speeds of 10 mph for much of the day and intolerable delays. In early June, 1992, the governor of Missouri declared the traffic congestion in the Branson area an "economic emergency" and announced a plan to fast-track the planning and design process of a proposed four-lane $1 60 million Ozark Mountain Highroad.
The challenge to the Missouri Highway and Transportation Department was to plan a totally new highway in six months without compromising safety or the integrity of the environmental process. With the fast track in mind and the N!'PA process in hand. an interdisciplinary team of agencies met on a regular and frequent basis. This resulted in the preparation of a quality project that integrated the needs of the environmentally sensitive Ozark Mountain Ecosystem with the need for increased recreational traffic in the area. With all the players and disciplines involved, every reasonable design ahernative and associated impact was on the table for discussion.

There were those on the team who, in the past, had seen NEPA as a burden, a hindrance, and something to be overcome. But as a result of the Highroad e,perience, these same people came to realize that NEPA could help to shape projects in a way that met the project purpose and need while serving to protect the environment and preserve other community values. Most important, the new attitudes forged during the N!'PA planning process have carried over into other projects that involve the same local, state, and federal agencies, and consulting firms.

2.3

The worldwide spread of

Box 2 .1 Example of an integrated and accelerated approach - the Ozark Mountain Highroad

Source: CEO 1997a

USA's states, plus the District of Columbia and Puerto Rico,4 have their own EIA systems that, because they are largely modelled on the Federal NEPA, are collectively referred to as the 'little NEPAs'. They require EIA for state actions (actions that require state funding or permission) and/or projects in sensitive areas. Other states have no specific EIA regulations, but have EIA requirements in addition to those of NEPA. 5

Of particular interest is the Californian system, established under the California Environmental Quality Act (CEQA) of 1973, and subsequent amendments. This is widely recognized as one of the most advanced EIA systems in the world. The legislation applies not only to government actions but also to the activities of private parties that require the approval of a government agency. It is not merely a procedural approach but one that requires state and local agencies to protect the environment by adopting feasible mitigation measures and alternatives in environmental impact reviews (EIRs). The legislation extends beyond projects to higher levels of actions, and an amend- ment in 1989 also added mandatory mitigation, monitoring and reporting requirements to CEQA. Guidance on the California system is provided in invaluable annual publications by the State of California, which sets out the CEQA Statutes and Guidelines in considerable detail. For the latest 2009 update of the Statute and Guidelines see the Association of Environmental Professionals, California website. A further amendment in 2010 added GHG emissions to the list of environmental impacts that must be analysed under CEQA.

EIA

Since the enactment of NEPA, EIA systems have been established in various forms throughout the world, beginning with more developed countries (e.g. Canada in 1973, Australia in 1974, West Germany in 1975, France in 1976) and later also in the less developed countries. rhe approval of a European Directive on EIA in 1985 stimulated the enactment of EIA legislation in many European countries in the late 1980s. The formation of new countries after the break-up of the Soviet Union in 1991 led to the enactment of EIA legislation in many of these countries in the early to mid- l 990s. The early 1990s also saw a large growth in the number of EIA regulations and guidelines established in Africa and South America. By 1996, more than 100 countries had EIA systems (Sadler 1996). Now, at least 140 countries have EIA sys- tems; Figure 2.2 summarizes the present state of EIA systems worldwide, to the best of the authors' knowledge.

These EIA systems vary greatly. Some arc in the form of mandatory reg11latio11s, acts or statutes; these are generally enforced by the authorities requiring the preparation of an adequate EIS before permis- sion is given for a project to proceed. In other cases, EIA guidelines have been established. These are not enforceable but generally impose obligations on the administering agency. Other legislation allows government officials to require E!As to be prepared at their discretion. Elsewhere, EIAs are prepared in an ad hoc manner, often because they are required by funding bodies (e.g. the World Bank, USAID) as part of a funding approval process. However, these classifications are not necessarily indicative of how thoroughly EIA is carried out. For instance, the EIA regulations of Brazil and the Philippines are not well carried out or enforced in practice (Glasson and Salvador 2000; Moreira 1988), whereas Japan's guidelines are thoroughly implemented.

Another important distinction between types of EIA system is that sometimes the actions that require EIA are given as a defi11itio11 (e.g. the USA's definition of 'major federal actions significantly affecting the quality of the human environment'), sometimes as a list of projects (e.g. roads of more than 10 km in length). Most countries use a list of projects, in part to avoid legal wrangling such as that surrounding NEPA's definition. Another distinction asks whether £IA is required for govem- ment projects only (as in NEPA), for private projects only or for both. Finally, some international devel- opment and funding agencies have set up ElA guidelines, including the European Bank for Reconstruction and Development (1992, 2010), UK Overseas Development Administration (1996), DFID (2003), UNEP (1997, 2002) and World Bank (1991, 1995, 1997, 1999, 2002, 2006).

Figure 2.2

EIA systems worldwide. The countries marked in green represent, to the best of our knowledge, those with EIA legislation (either framework or detailed). The figure makes no judgement about the breadth and quality of the legislation, or whether it is adequately implemented. The authors apologize for any omissions or I.naccurac1.es.

The UK has had formal legislation for EIA since 1988, in the form of several laws that implement European Community Directive 85/337/EEC (CEC 1985) and subsequent amendments. It is quite possible that without pressure from the European Commission such legislation would have been enacted much more slowly, since the UK govern- ment felt that its existing planning system more than adequately controlled environmentally un- suitable developments. However, this does not mean that the UK had no EIA system at all before 1988; many EIAs were prepared voluntarily or at the request of local authorities, and guidelines for EIA preparation were drawn up.

The UK's statutory land-use planning system has since 1947 required local planning authorities (LPAs) to anticipate likely development pres- sures, assess their significance, and allocate land, as appropriate, to accommodate them. Environ- mental factors are a fundamental consideration in this assessment. Most developments require planning consent, so environmentally harmful developments can be prevented by its denial. This system resulted in the accumulation of consider- able planning expertise concerning the likely consequences of development proposals. After the mid-l 960s, however, the planning system began to seem less effective at controlling the impacts of large developments. The increasing scale and complexity of developments, the conse- quent greater social and physical environmental impacts and the growing internationalization of developers (e.g. oil, gas and chemicals companies) all outstripped the capability of the development control system to predict and control the impacts of developments. In the late 1960s, public concern about environmental protection also grew consid- erably, and the relation between statutory planning controls and the development of large projects came under increasing scrutiny. This became particularly obvious in the case of the proposed third London Airport. The Roskill Commission was established to select the most suitable site for
The UK has had formal legislation for EIA since
1988, in the form of several laws that implement
Community

large industrial developments. PADC produced an interim report, The assessment o(nwjor industrial applications - a nwmull (Clark et al. 1976), which was issued free of charge to all LPAs in the UK and 'commended by central government for use by planning authorities, government agencies and developers'. The PADC procedure was designed to fit into the existing planning framework, and was used to assess a variety of (primarily private sector) projects. An extended and updated version of the manual was issued in 1981 (Clark et al. 1981).

In 1974, the Secretaries of State for the Environ- ment, Scotland and Wales commissioned consult- ants to investigate the 'desirability of introducing a system of impact analysis in Great Britain, the circumstances in which a system should apply, the projects it should cover and the way in which it might be incorporated into the development control system' (Catlow and Thirwall 1976). The resulting report made recommendations about who should be responsible for preparing and pay- ing for EIAs, what legislative changes would be needed to institute an EIA system, and similar issues. The report concluded that about 25-50 EIAs per year would be needed, for both public and private sector projects. EIA was given further sup- port by the Dobry Report on the development control system (Dobry 1975), which advocated that LPAs should require developers to submit impact studies for particularly significant develop- ment proposals. The report outlined the main topics such a study should address, and the infor- mation that should be required from developers. Government reactions to the Dobry Report were mixed, although the influential Royal Commission on Environmental Pollution endorsed the report.

However, overall the DoE remained sceptical about the need, practicality and cost of EIA. In

fact, the government's approach to EIA was described as being 'from the outset grudging and minimalist' (CPRE 1991). In response to the Catlow and Thirwall report, the DoE stated: 'Consideration of the report by local authorities should not be allowed to delay normal planning procedures and any new procedures involving additional calls on central or local government finance and manpower
are unacceptable during the present period of economic restraint' (DoE 1977). A year later, after much deliberation, the DoE was slightly more positive:

We fully endorse the desirability ... of ensur- ing careful evaluation of the possible effects of large developments on the environment
... The approach suggested by Thirwall/ Catlow is already being adopted with many lprojectsl ... The sensible use of this approach [should) improve the practice in handling these relatively few large and significant proposals. (DoE 1978)

The government's foreword to the PADC man- ual of 1981 also emphasized the need to minimize the costs of EIA procedures: 'It is important that the approach suggested in the report should be used selectively to fit the circumstances of the pro- posed development and with due economy' (Clark et al. 1981). As will be seen in later chapters, the government remained sceptical for some time about the value of EIA, and about extending its remit, as suggested by the EC. But by the early 1980s, more than 200 studies on the environ- mental impacts of projects in the UK had been prepared on an ad hoc basis (Petts and Hills 1982). Many of these studies were not full EIAs, but focused on only a few impacts. However, large developers such as British Petroleum, British Gas, the Central Electricity Generating Board and the National Coal Board were preparing a series of increasingly comprehensive statements. In the case of British Gas, these were shown to be a good investment, saving the company £30 million in IO years (House of Lords 198la).

industrial

discretion. Other Member States were eager to ensure that the Directive reflected the requirements of their own more rigorous systems of EIA. Since the Directive's implementation, EIA activity in all the EU Member States has increased dramatically.

The EC had two main reasons for wanting to establish a uniform system of EIA in all its Member States. First, it was concerned about the state of the physical environment and cager to prevent further environmental deterioration. The EC's First Action Programme on the Environment of 1973 (CEC 1973) advocated the prevention of environ- mental harm: 'the best environmental policy consists of preventing the creation of pollution or nuisances at source, rather than subsequently trying to counteract their effects', and, to that end, 'effects on the environment should be taken into account at the earliest possible stage in all technical planning and decision-making processes'. Further Action Programmes of 1977, 1983, 1987, 1992 and 2001 have reinforced this emphasis. Land-use planning was seen as an important way of putting these principles into practice, and EIA was viewed as a crucial technique for incorporating environ- mental considerations into the planning process. Second, the EC was concerned to ensure that no distortion of competition should arise through which one Member State could gain unfair advantage by permitting developments that, for environmental reasons, might be refused by another. In other words, it considered environ- mental policies necessary for the maintenance of a level economic playing field. Further motivation for EC action included a desire to encourage best practice across Member States. In addition, pollu- tion problems transcend territorial boundaries (witness acid rain and river pollution in Europe), and the EC can contribute at least a sub-continental
response framework.
rhe EC began to commission research on EIA in 1975. Five years later and after more than 20 drafts, the EC presented a draft directive to the Council of Ministers (CEC 1980); it was circulated throughout the Member States. The 1980 draft attempted to reconcile several conflicting needs. It sought to benefit from the US experience with NEPA, but to develop policies appropriate to
European need. It also sought to make EIA applicable to all actions likely to have a significant environmental impact, but to ensure that proce- dures would be practicable. Finally, and perhaps most challenging, it sought to make EIA require- ments flexible enough to adapt to the needs and institutional arrangements of the various Member States, but uniform enough to prevent problems arising from widely varying interpretations of the procedures. The harmonization of the types of project to be subject to EI/\, the main obligations of the developers and the contents of the EIJ\s were considered particularly important (Lee and Wood 1984; Tomlinson 1986).
As a result, the draft directive incorporated a number of important features. First, planning permission for projects was to be granted only after an adequate EIA had been completed. Second,

LPAs and developers were to co-operate in providing information on the environmental impacts of proposed developments. Third, statu- tory bodies responsible for environmental issues, and other Member States in cases of trans-frontier effects, were to be consulted. Finally, the public was to be informed and allowed to comment on issues related to project development.

In the UK the draft directive was examined by the House of Lords Select Committee on the European Commission, where it received wide- spread support:

The present draft Directive strikes the right kind of balance: it provides a framework of common administrative practices which will allow Member States with effective planning controls to continue with their system ... while containing enough detail to ensure that the intention of the draft cannot be evaded ... The Directive could be imple- mented in the United Kingdom in a way which would not lead to undue additions delay and costs in planning procedures and which need not therefore result in economic and other disadvantages. (House of Lords 1981a)

discretion. Other Member States were eager to
ensure
litigation that would be associated with the proposed directive (House of Lords 1981b). The UK Royal rown Planning Institute (RTP[) also commented on several drafts of the directive. Generally the RTPI favoured it, but was concerned that it might cause the planning system to become too rigid:

The Institute welcomes the initiative taken by the European Commission to secure more widespread use of EIA as it believes that the appropriate use of EIA could both speed up and improve the quality of decisions on certain types of development proposals. However, it is seriously concerned that the proposed Directive, as presently drafted, would excessively codify and formalize procedures of which there is limited experi- ence and therefore their bcncfi ts arc not yet proven. Accordingly the Institute recom- mends the deletion of Article 4 and annexes of the draft. (House of Lords 1981a)

More generally, slow progress in the implemen- tation of EC legislation was symptomatic of the wide range of interest groups involved, of the lack of public support for increasing the scope of town planning and environmental protection procedures, and of the unwillingness of Member States to adapt their widely varying planning systems and environmental protection legislation to those of other countries (Williams 1988). In March 1982, after considering the many views expressed by the Member States, the Commission published proposed amendments to the draft directive (CEC 1982). Approval was further delayed by the Danish government, which was concerned about projects authorized by Acts of Parliament. On 7 March 1985, the Council of Ministers agreed on the proposal; it was formally adopted as a directive on 27 June 1985 (CEC 1985) and became
operational on 3 July 1988.

Subsequently, the EC's l'ifth Action Programme, Towards sustainability (CEC 1992), stressed the importance of EIA, particularly in helping to achieve sustainable development, and the need to expand the remit of EIA:

Given the goal of achieving sustainable development it seems only logical, if not essential, to apply an assessment of the environmental implications of all relevant policies, plans and programmes. The integra- tion of environmental assessment within the macro-planning process would not only enhance the protection of the environment and encourage optimization of resource management but would also help to reduce those disparities in the international and inter-regional competition for new develop- ment projects which at present arise from disparities in assessment practices in the Member States ...

The EIA Directive can be seen as a work in progress. It has undergone regular reviews to improve procedures and to seek consistency of application. In response to a five-year review of the Directive (CEC 1993), amendments to the Directive were agreed in 1997. Further minor amendments followed in 2003 and 2009. Appendix 1 gives the complete consolidated version of the amended Directive as at June 2011. The rest of Section 2.S now summarizes the original Directive.
Section
litigation that would be associated with the
commented on several drafts of the directive.
Directive and have considerable discretion. According to the Directive, EIA is required for two classes of project, one mandatory (Annex I) and one discretionary (Annex II):

projects of the classes listed in Annex I shall be made subject to an assessment ... for projects listed in Annex II, the Member States shall determine through: (al a case-by-case examination; or (b) thresholds or criteria set by the Member State whether the project shall be made subject to an assessment ... When [doing so], the relevant selection criteria set out in

Annex Ill shall be taken into account. (Article 4l
Table 2.4 summarizes the projects listed in Annexes I and II. The EC (CEC 1995) also published guidelines to help Member States determine whether a project requires EIA.
Similarly, the information required in an EIA is listed in Annex III of the Directive, but must only be provided
inasmuch as: (a) The Member States consider that the information is relevant to a given stage of the consent procedure and to the specific characteristics of a particular project ... and of the environmental features likely to be affected; (bl The Member States consider that a developer may reasonably be required to compile this information having regard inter alia to current knowledge and methods of assessment. (Article 5.1)
Table 2.5 summarizes the information required by Annex III (Annex IV, post-amendments). A developer is thus required to prepare an EIS that includes the information specified by the relevant Member State's interpretation of Annex III (Annex IV, post-amendments) and to submit it to the 'competent authority'. This EIS is then circulated to other relevant public authorities and made publicly available: 'Member States shall take the measures necessary to ensure that the authorities likely to be concerned by the project ... are given an oppor- tunity to express their opinion' (Article 6.1).
Member States are also to ensure that:

- any request for development consent and any information gathered pursuant to [the

1 Crude oil refineries, coal/shale gasification and liquefaction

2 Thermal power stations and other combustion installations; nuclear power stations and other nuclear reactors

3 Radioactive waste processing and/or storage installations

4 Cast-iron and steel smelting works

5 Asbestos extraction, processing or transformation

6 Integrated chemical installations

7 Construction of motorways, express roads, other large roads, railways, airports

8 Trading ports and inland waterways

9 Installations for incinerating, treating or disposing of toxic and dangerous wastes

10 Large-scale installation for incinerating or treating non- hazardous waste

11 Large-scale groundwater abstraction or recharge schemes

12 Large-scale transfer of water resources

13 Large-scale waste water treatment plants

14 Large-scale extraction of petroleum and natural gas

15 Large dams and reservoirs

16
 Long pipelines for gas, oil or chemicals

17
 Large-scale poultry or pig-rearing installations

18
 Pulp, limber or board manufacture

19
 Large-scale quarries or open-cast mines

20
 Long overhead electrical power lines

21
 Large-scale installations for petroleum, petrochemical or chemical products

22
 Any change or extension to an Annex I project that meets the 23
 Carbon storage sites ..

24
 Carbon capture installations··

Table 2.4 Projects requiring EIA under EC Directive 85/337
(as amended)'

AnnexI (mandatory)
thresholds ..

AnnexII (discretionary)
1
 Agriculture, silviculture and aquaculture

2
 Extractive industry

3
 Energy industry

4
 Production and processing of metals

5
 Minerals industry (projects not included in Annex I)

6
 Chemical industry

7
 Food induslry

8
 Textile, lealher, wood and paper induslries

9
 Rubber industry

10	Infrastructure projects
11	Other projects
12	Tourism and leisure
13	Modification, extension or temporary testing of Annex I projects

• 1997 amendments are shown in ilalic; "are from later amendments in 2003 and 2009.

Table 2.5 Information required in an EIA under EC Directive 85/337 (asamended)'

Annex Ill (/\.1	
1	Description of the project
2	Where appropriate (an outline of main alternatives studied and an indication of the main reasons for the final choice)
3	Aspects of 1he environment likely lo be significan1Iy affected by the proposed project, including population, fauna, flora, soil, waler, air climatic fac1ors, material assets, architectural and archaeological heritage, landscape, and the interrelationship between them
4	Likely significant effects of the proposed project on the environment
5	Measures 1o prevent, reduce and where possible offset any significant adverse environmental effects
6	Non-technical summary
7	Any difficulties encountered in compiling the required information

• Amendment is shown in italics.

that the 'basics of the EIA are mostly in place', there was concern about the incomplete coverage of certain projects, insufficient consultation and public participation, the lack of information about alternatives, weak monitoring and the lack of consistency in Member States' implementation. The review process, as with the original Directive, generated considerable debate between the Com- mission and the Member States, and the amended Directive went through several versions, with some weakening of the proposed changes. The outcome, finalized in March 1997, and to be implemented within two years, included the following amend- ments:

•
Annex I (mandatory): the addition of 12 new classes of project (e.g. dams and reservoirs, pipelines, quarries and open-cast mining) (Table 2.4).

•
Directive's provisions] are made available to the public;
•
the public concerned is given the opportunity 2.6
EC Directive 85/337, as • amended by Directive 97/11/EC

to express an opinion before the project is •
initiated.

The detailed arrangements for such information and consultation shall be determined by the Member States (Articles 6.2 and 6.3) (see Section 6.2 also). The competent authority must consider the information presented in an EIS, the comments of relevant authorities and the public, and the comments of other Member States (where applicable) in its consent procedure (Article 8). The CEC (1994) published a checklist to help competent authorities to review environmental information. It must then inform the public of the decision and any conditions attached to it (Article 9).
•
Directive 85/337 included a requirement for a five- year review, and a report was published in 1993 (CEC 1993). While there was general satisfaction
Annex II (discretionary): the addition of 8 new sub-classes of project (plus extension to 10 others), including shopping and car parks, and particularly tourism and leisure (e.g. caravan sites and theme parks) (Table 2.4). New Annex Ill lists matters that must be considered in EIA, including:
Characteristics of projects: size, cumula- tive impacts, the use of natural resources, the production of waste, pollution and nuisance, the risk of accidents.
Location of projects: designated areas and their characteristics, existing and previous land uses.
Characteristics of the potential impacts: geographical extent, trans-frontier effects, the magnitude and complexity of impacts, the probability of impact, the duration, frequency and reversibility of impacts.
Change of previous Annex Ill to Annex IV: small changes in content.
Other changes:
Article 2.3: There is no exemption from consultation with other Member States on transboundary effects.
Article 4: When deciding which Annex II projects will require EIA, Member States can use thresholds, case by case or a combination of the two.
Article 5.2: A developer may request an opinion about the information to be supplied in an environmental statement (ES), and a competent authority must provide that information. Member States may require authorities to give an opinion irrespective of the request from the developer.
Article 5.3: The minimum information provided by the developer must include an outline of the main alternatives studied and an indication of the main reasons for the final choice between alternatives.
Article 7: rhis requires consultation with affected Member States, and other countries, about transboundary effects.6 Article 9: A competent authority must make public the mai11 reasons and con- siderations on which decisions are based,
which seek to establish a mandatory framework for European policies while leaving the 'scope and method' of implementation to each Member State. In addition, whatever the degree of 'legal harmonization' of Member State EIA policies, there is also the issue of 'practical harmonization'. Implementation depends on practitioners from public and private sectors, who invariably have their own national cultures and approaches.
An early inconsistency was in the timing of implementation of the original Directive. Some countries, including France, the Netherlands and the UK, implemented the Directive relatively on time; others (e.g. Belgium, Portugal) did not. Other differences, understandably, reflected

variations in legal systems, governance and culture between the Member States, and several of these differences are outlined below.
together with a description of the mail1 •
mitigation measures (CEC 1997a).

A consolidated version of the full Directive, as amended by these changes, is included in Appendix 1. There are more projects subject to mandatory EIA (Annex I) and discretionary EIA (Annex II). Alternatives also became mandatory, and there is more emphasis on consultation and participation. The likely implication is more EIA activity in the EU Member States, which also have to face up to some challenging issues when dealing with topics such as alternatives, risk assessment (RA) and cumulative impacts.

in a converging system? •
The EU has been active in the field of environ- mental policy, and the EIA Directive is widely regarded as one of its more significant environ- mental achievements (see CEC 2001). However, there has been, and continues to be, concern about the inconsistency of application across the (increasing number of) Member States (see CEC 1993, CEC 2003, Glasson and Bellanger 2003). This partly reflects the nature of EC/EU directives,
The legal implementation of the Directive by the Member States differed considerably. For some, the regulations come under the broad remit of nature conservation (e.g. France, Greece, the Netherlands, Portugal); for some they come under the planning system (e.g. Denmark, Ireland, Sweden, the UK); in others specific EIA legislation was enacted (e.g. Belgium, Italy). In addition, in Belgium, and to an extent in Germany and Spain, the responsibility for EIA was devolved to the regional level.
Article 5.2: A developer may request an
opinion about the information to be
Thedecision to proceed with a project is, in the simplest case, the responsibility of the com- petent authority (e.g. in flanders, Germany, the UK). However, in some cases the minister responsible for the environment must first decide whether a project is environmentally compatible (e.g. in Denmark, Italy, Portugal).

The first five-year review of the original Directive (CEC 1993) expressed concern about a range of inconsistencies in the operational procedures across the Member States (project coverage, alternatives, public participation, etc.). As a result, several Member States strengthened their regulations to achieve a fuller implementation. A second five-year review in 1997 (CEC 1997b) had the following key findings:

- EIA is a regular feature of project licensing/ authorization systems, yet wide variation exists in relation to those procedures (e.g. different procedural steps, relationships with

other relevant procedures);

- While all Member States had made provision for the EIA of the projects listed in Annex I, there were different interpretations and 2.7.2
Review of the amended Directive 97/11/EC

procedures for Annex II projects;
the main alternatives studied, and an indication of the main reasons for their choices, taking into account environmental effects. The amended Directive also enables a developer, if it so wishes, to ask a competent authority for formal advice on the scope of the information that should be included in a particular EIS. Member States, if they so wish, can require competent authorities to give an opinion on the scope of any new proposed EIS, whether the developer has requested one or not. The amended Directive also strengthens consultation and publicity, obliging competent authorities to take into account the results of consultations with the public and the reasons and considerations on which the decision on a project proposal has been based.

A third review of the original Directive, as amended by Directive 97/11/EC (CEC 1997a), undertaken for the EC by the Impacts Assessment Unit at Oxford Brookes University (UK), provided a detailed overview of the implementation of the Directive (as amended) by Member States, and recommen- dations for further enhancement of application and effectiveness (CEC 2003). Some of the key implementation issues identified included:

- quality control over the EIA process is deficient; •
- Member States did not give enough attention to the consideration of alternatives;
- improvements had been made on public participation and consultation; and
- Member States, themselves, complained about the ambiguity and lack of definitions of several

key terms in the Directive. •

The amendments of 1997 sought to reduce further several of the remaining differences. In addition to the substantial extensions and modification to the list of projects in Annex I and Annex 11, the amended Directive (CEC 1997a) also strengthened the procedural base of the EIA Directive. This included a provision for new screening arrangements, including new screening criteria (in Annex III) for Annex II projects. It also introduced EIS content changes, including an obligation on developers to include an outline of
Thedecision

for Annex II projects. However, the 2003 review revealed that there were still major variations in the nature of the thresholds used. • For example, with afforestation projects the area of planting that triggered mandatory EIA ranged from 30 ha in Denmark to 350 ha in Portugal. Similarly, three turbines would trigger mandatory EIA for a wind farm in Sweden, compared with SO in Spain. Consid- erable variations also continue to exist in the detailed specification of which projects were covered by some Annex II categories, with lO(b) (urban development) being particularly problematic.

- Considerable variation in the number of E!As being carried out in Member States. Documentation is complicated by inadequate data in some countries, but Table 2.6 shows the continuing great variation in annual output from over 7,000 (in France, where a relatively low financial criterion is a key trigger) to fewer than 20 (in Austria). While some of the variation may be explained by the relative economic conditions within coun- tries, it also relates to the variations in levels at which thresholds have been set. The amend- ments to the Directive do seem to be bringing 2.8
 Continuing issues, review and refinement of the EIA Directive in EU-27

more projects into the EIA process in some Member States.
Some improvement, but still issues in relation to the scoping stage, and consideration of alternatives. Until the amendments made it a more formal stage of the EIA process, scoping was carried out as a discrete and mandatory step in only a few countries. The amended Directive allows Member States to make this a mandatory procedure if they so wish; seven of the Member States have such procedures in place. Commitment to scoping in the other Member States is more variable. Similarly, the consideration of alternatives to a proposed project was mandatory in only a very few countries, including the Netherlands, which also required an analysis of the most environ- mentally acceptable alternatives in each case. The amended Directive required developers to include an outline of the main alternatives studied. The 2003 review showed that in some Member States the consideration of alterna- tives is a central focus of the EIA process; elsewhere the coverage is less adequate - although the majority of countries do now require assessment of the zero ('do minimum') alternative.

Table 2.6 Change in the amount of EIA activity in EU-15 Member States

Country
 Pre

Post

Austria
4
10-20

Belgium - Brussels
20
20

Belgium - Flanders
No data
20% increase

Belgium - Walloon
No data
est. increase

Denmark
28
100

Finland
22
25

France
6,000-7,000
7,000+

Germany
1,000
est. increase

Greece
1,600
1,600

Ireland
140
178

Italy
37
No data

Luxembourg
20
20

Netherlands
70
70

Portugal
87
92

Spain
120
290

Sweden
1,000
1,000

UK
300
500

Source: CEC 2003

Variations in nature of public consultation required in the EIA process. The Directive requires an EIS to be made available after it is handed to the competent authority, and throughout the EU the public is given an opportunity to comment on the projects that are subject to EIA. However, the extent of public involvement and the interpretation of 'the public concerned' varied from quite narrow to wide. In Denmark, the Netherlands and Wallonia, the public is consulted during the scoping process. In the Netherlands and Flanders, a public hearing must be held after the EIS is submitted. In Spain, the public must be consulted before the EIS is submitted. In Austria, the public can participate at several stages of an EIA, and citizens' groups and the Ombudsman for the Environment have special status. The transposition of the Aarhus Convention into EIA legislation provided an opportunity for further improvements in public participation in EIA (CEC 2001).
Variations in some key clements of EIA/EIS content, relating in particular to biodiversity, human health, risk and cumulative impacts. While the EIA Directive does not make explicit reference to biodiversity and to health impacts, both can be seen as of increasing importance for EIA. There arc some examples of good practice in the Netherlands and Finland for biodiversity, and in the Nether- lands again for health impact assessment. On the other hand, the amended Directive (Annex III) includes risk and cumulative impacts. The 2003 review showed that although RAs appear in many EISs, for most Member States risk was seen as separate from the EIA process and handled by other control regimes. The review also showed a growing awareness of cumula- tive impacts, with measures put in place in many Member States (e.g. France, Portugal, Finland, Germany, Sweden and Denmark) to address them. However, it would seem that Member States arc still grappling with the nature and dimensions of cumulative impacts. Lack of systematic monitoring of a project's actual impacts by the competent authority. Despite widespread concern about this Achilles' heel in the EIA Directive, there was considerable resistance to the inclusion
of a requirement for mandatory monitoring. As such, there are very few good examples (e.g. the Netherlands) of a mandatory and systematic approach. Dutch legislation re- quires the competent authority to draw up an evaluation programme, which compares actual outcomes with those predicted in the EIS. If the evaluation shows effects worse than predicted, the competent authority may order extra environmental measures. In Greece, legislation provides for a review of the Eli\ outcome as part of the renewal procedure for an environmental permit.

Overall, the 2003 review showed that there were both strengths and weaknesses in the operation of the Directive, as amended. There are many examples of good practice, and the amendments have provided a significant strengthening of the procedural base of EIA, and have brought more harmonization in some areas - for example on the projects subject to EIA. Yet, as noted here, there is still a wide disparity in both the approach and the application of EIA in the Member States, and significant weaknesses remain to be addressed. The review concluded with a number of recommen- dations. These included advice to Member States to, inter alia, better record on an annual basis the nature of EIA activity; check national legislation with regard to aspects such as thresholds, quality control, cumulative impacts; make more use of EC guidance (e.g. on screening, scoping and review); and improve training provision for EIA. Section 2.8 continues the ongoing story of review and refine- ment of the Directive in the enlarged EU.

There have been further reviews of the application and effectiveness of the EIA Directive, and as a result some limited changes were made to the Directive in 2003 and in 2009. Appendix 1 provides a consolidated version of the Directive (as at June 2011), but there may be further changes following another round of consultation (in late 2010) on
implementation. A particular interesting feature of recent reviews, especially on the operation of the 2003 amended Directive, is the nature of implementation by the new Member States that joined the EU in 2004 and 2007 (CEC 2009a).
The 2009 review had a wide brief, examining: the application of the amended Directive as a

whole, including the additional 2003 EIA proced- ures (which focused particularly on the integration of the requirements of the Aarhus Convention on public participation into the Directive), general trends in the performance of the Directive, the status of national systems, developments in EIA systems in the old Member States and the new Member States, and the relationships with other Directives. The main changes introduced by Direc- tive 2003/35/EC were:

- definition of the 'public' and 'the public concerned' (new Article 1.2);
- option to include provisions in law exempt- ing national defence projects from EIA now only allowed on a case-by-case basis (new Article 1.4);
- strengthened public consultation provision:

early in the decision-making procedure, detailed list of information to be provided, reasonable time frames (new Articles 6.2 and 6.3);
information on the public participation process within the information provided on the final decision (Article 9.1);

- new provisions on public access to a review

procedure (Article lO(a)); and

- changes or extensions of Annex I projects and other modifications of Annex I projects and modifications of Annex II projects. 2.9
Summary

The 2009 changes were much more limited and focused on the addition of new projects - for example carbon capture and storage installations. Overall, the European Commission was very positive about the benefits of the Directive:

Two major benefits have been identified. Firstly, the EIA ensures that environmental considerations are taken into account as early as possible in the decision-making process. Secondly, by involving the public, the EIA procedure ensures more transparency in environmental decision-making and, conse- quently, social acceptance. Even if most benefits of the ElA cannot be expressed in monetary terms, there is widespread agree- ment, confirmed by the studies available, that the benefits of carrying out an EIA outweigh the costs of preparing an EIA. (CEC 2009b)

The experience and performance of the 12 new Member States (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia) is of particular interest. In these countries, the EIA Directive had been transposed as part of the accession require- ments to ensure harmonization of the national legislation with the EU Acquis, and these Member States were ready to incorporate the requirements of the Aarhus Convention. In many respects, the new Member States have the advantage of learn- ing from the evolving EIA procedures and practice of the EU and its old Member States, and can provide some examples of innovative practice (see example of Poland in Chapter !OJ. But they have also encountered some of the issues raised by the other states in earlier reviews. The number of E!As is increasing in many of the new Member States, but there is considerable variation between the states (although the data in Table 2.7 are distorted by the inclusion of total screening decisions in some cases). Scoping is mandatory in all the states, with the exception of Cyprus and Slovenia. Quality review of the EIA documenta- tion, either by the competent authority, or an expert committee, is a legal requirement in all the states, and several make good use of EU guidance on topics such as review and screening. But there are concerns about carrying out EIA in a trans- boundary context, consideration of human health protection in EIA, the 'salami slicing' of projects to fit under EIA thresholds, and the need for up- dated EU guidance on several issues, including how to address the thorny issue of the cumulative impacts of projects.

Notwithstanding good progress over 20 years of implementation, the EU has ongoing concerns about some stubborn issues, including those already mentioned - such as variations in screen- ing, transboundary problems, and concerns about quality control. Another serious and longstanding

Table 2.7 Number of EIAs carried out in the new EU Member States

Member	Annex I		Annex II		Tendencies
	2005	2006	2005	2006	
Bulgaria	77	88	2,212	2,457(incl. screening decisions)	Increase
Cyprus		30		45	Increase
Czech Republic		72		125	Increase
Estonia		57		20	Decrease
Hungary		70-90		370-400 (incl. screening procedures)	Static
Latvia		40			

5(the number indicates finished EIAs)

Increase

Li1huania

12

838

Static

Malta
4

6
Increase

Poland
n/a
n/a
n/a
n/a

n/a

Romania

179

643

Increase

Slovakia
90
135
429
363

Static

Slovenia
n/a
n/a
n/a
n/a

n/a

Source: CEC 2009a

issue is the lack of a mandatory monitoring requirement; a more recent issue includes the relationship between the EIA and SEA Directives, and the very limited hierarchical tiering in practice. There is also recognition of the urgent need to improve requirements and guidance on covering climate change issues in EIA, especially for energy and transport infrastructure projects, and those for which energy efficiency is a key issue. Further changes to EIA legislation are likely following the 2010 round of consultation on implementation of the Directive.

This chapter has reviewed the development of ElA worldwide, from its unexpectedly successful beginnings in the USA to recent developments in the EU. In practice, EIA ranges from the production of very simple ad hoc reports to the production of

extremely bulky and complex documents, from wide-ranging to non-existent consultation with the public, from detailed quantitative predictions to broad statements about likely future trends. In the EU, reviews of EIA experience show that 'overall, although practice is divergent, it may not be diverging, and recent actions such as the amended Directive appear to be "hardening up" the regulatory framework and may encourage more convergence' (Glasson and Bellanger 2003). All these systems worldwide have the broad aim of improving decision-making by raising decision-makers' awareness of a proposed action's environ- mental consequences. Over the past 40 years, EIA has become an important tool in project planning, and its applications are likely to expand further. Chapter 10 provides further discussion of £IA systems internationally and Chapter 11 dis- cusses the widening of scope to strategic environ- mental assessment of policies, plans and pro- grammes. The next chapter focuses on £IA in the UK context.

SOME QUESTIONS

TIie following questiom are intended to help tlze reader {oms 011 tlze important issues of this chapter, and to start building some understanding of tlze origins and development ofEIA.

1 Why do you think EIA had its origins, in NEPA, in the USA in the late 1960s?

2 What arc the key differences, under NEPA, of the processes for a FONSI and for a full EIS?

3 How do you explain the recent trends in EISs filed under NEPA over the last 10-15 years?

4 As for all EIA systems, there arc concerns about procedural issues. Note some of the recent concerns about the operation of EIA under NEPA.

S Is there any clear pattern to the spread of EIA across countries and continents?

6 Why was there strong initial resistance to the introduction of EIA in the UK?

7 What were the key drivers behind the introduction of the EC EIA Directive 85/337?

8 What is the difference between Annex I and Annex II projects under the EC EIA Directive?

9 What were the main changes introduced to the EIA Directive under the 97/11/EC amendments?

10 Identify several examples of (i) good practice and (ii) significant weaknesses highlighted by the 2003 review of the implementation of the amended EIA Directive.

11 What factors might explain the variations in Member States' EIA activity illustrated in Tables

2.6 and 2.7?

12 What is the Aarhus Convention, and what are its implications for the EIA Directive?

13 What do you see as some of the stubborn issues still to be resolved in the EC EIA Directive?

14 From what you have covered in Chapter 2, are there now grounds for saying that there is clear evidence of a more consistent system of EIA across the 27 EU Member States?

Notes

For example, Ely v. Velds, 451 F.2d 1130, 4th Cir. 1971: Carolina Action v. Simon, 522 F.2d 295, 4th Cir. 1975.

2 Calvert Cliff's Coordinating Committee, Inc. v. United States Atomic Energy Commission 449 F .2d 1109, DC Cir. 1971.

3 Natural Resources Defense Council, Inc. v. Morton, 458 F.2d 827, DC Cir. 1972.

4 California, Connecticut, Georgia, Hawaii, Indiana, Maryland, Massachusetts, Minnesota, Montana, New York, North Carolina, South Dakota, Virginia, Washington and Wisconsin, plus the District of Columbia and Puerto Rica.

5 Arizona, Arkansas, Delaware, Florida, Louisiana, Michigan, New Jersey, North Dakota, Oregon, Pennsylvania, Rhode Island and Utah.

6 Amendments to Articles 7 and 9 were influenced by the requirements of the Espoo Convention on EIA in a Transboundary Context, signed by 29 countries and the EU in 1991. This widened and strengthened the requirements for consultation with Member States where a significant transboundary impact is identified. The Convention deals with both projects and impacts that cross boundaries and is not limited to a consideration of projects that are in close proximity to a boundary.

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3 UK agency and legislative context

3.1 Introduction

3.2 The principal actors

3.2.1 An overview

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planning and development process broadly into four main groups. These are:

This chapter discusses the legislative framework within which EIA is carried out in the UK. It begins with an outline of the principal actors involved in EIA and in the associated planning and develop- ment process. It follows with an overview first of relevant regulations and the types of project to which they apply, and then of the EIA procedures required by the recently revised Town and Country Planning (T&CP) regulations 2011.These can be considered the 'generic' EIA regulations that apply to most projects and provide a model for the other EIA regulations. The latter are then summarized. Readers should refer to Chapter 8 for a discussion of the main effects and limitations of the appli- cation of these regulations.

Any proposed major development has an under- lying configuration of interests, strategies and perspectives. But whatever the development, be it a motorway, a power station, a reservoir or a forest, it is possible to divide those involved in the

- the developers;
- those directly or indirectly affected by or having an interest in the development;
- the government and regulatory agencies; and
-

various intermediaries (consultants, advocates, advisers) with an interest in the interaction between the developer, the affected parties and the regulators (Figure 3.1). 3.2.2 Developers

An introduction to the range of 'actors' involved is an important first step in understanding the UK legislative framework for EIA.

In the UK, EIA applies to projects in both the public and private sectors, although there are notable exemptions, including Ministry of Defence developments and those of the Crown Commission. Public sector developments are sponsored by central government departments such as the Department for Transport (DfT), by local authori- ties and by statutory bodies, such as the Environ- ment Agency and the Highways Agency. Some were also sponsored by nationalized industries (such as the former British Rail and the nuclear industry), but the rapid privatization programme since the 1980s has transferred most former nationalized industries to the private sector. Some, such as the major energy companies (British Gas, National Grid and EDf) and the regional water authorities, have major and continuing program- mes of projects, where it may be possible to develop and refine EIA procedures, learning from experi- ence. Many other private-sector companies, often of multinational form, may also produce a stream of projects. However, for many developers, a major project may be a one-off or 'once in a lifetime' activity. For them, the EIA process, and the associated planning and development process, may be much less familiar, requiring quick learning and, it is to be hoped, the provision of some good advice.

Those parties directly or indirectly affected by such developments arc many. In Figure 3.1 they have been broadly categorized, according to their role or degree of power (e.g. statutory, advisory), level of operation (e.g. international, national, local) or emphasis (e.g. environmental, economic). The growth in environmental groups, such as Greenpeace, Friends of the Earth, the Campaign to Protect Rural England (CPRE) and the Royal Society for the Protection of Birds (RSPB), is of particular note and is partly associated with the growing public interest in environmental issues. For instance, membership of the RSPB grew from

Figure 3.1

Principal actors in the EIA and planning and development processes

100,000 in 1970 to over a million in 1997, and has maintained this high level since. Membership of Sustrans, a charity that promotes car-free cycle routes, rose from 4,000 in 1993 to 20,000 in 1996; CPRE has over 60,000 members. Such groups, although often limited in resources, may have considerable 'moral weight'. The accommodation of their interests by a developer is often viewed as an important step in the 'legitimization' of a project. Like the developers, some environmental groups, especially at the national level, may have a long-term, continuing role. Some local amenity groups also may have a continuing role and an accumulation of valuable knowledge about the local environment. Others, usually at the local level, may have a short life, being associated with one particular project. In this latter category we can place local pressure groups, which can spring up quickly to oppose developments. Such groups have sometimes been referred to as NIMBY ('not in my back yard'), and their aims often include the maintenance of property values and existing lifestyles, and the diversion of any necessary development elsewhere. Another colourful relation of this group is BANANA ('build absolutely nothing anywhere near anything').

Statutory consultees are an important group in the EIA process. The planning authority must consult such bodies before making a decision on a major project requiring an EIA. Statutory consultees in England include Natural England (NE), the Marine Management Organization (MMO), the Environment Agency (for certain developments), and the principal local council for the area in which the project is proposed. Other consultees often involved include the local highway authority and the county archaeologist. As noted above, non-statutory bodies, such as the RSPB and the general public, may provide additional valuable information on environmental issues.

The government, at various levels, will normally have a significant role in regulating and managing the relationship between the groups previously outlined. As discussed in Chapter 2, the European Commission has adopted a Directive on EIA procedures (CEC 1985 and amendments). The UK government has subsequently implemented these through an array of regulations and guidance (see Section 3.3). The principal department involved currently is (2012) the Department for Communities and Local Government (DCLG; formerly ODPM, DTLR, DETR and DoE!) through its London headquarters. Of particular importance in the EIA process is the local authority, and especially the relevant local planning authority (LPA). This may involve district, county and unitary authorities. Such authorities act as filters through which schemes proposed by developers usually have to pass. In addition, the LPA often opens the door for other agencies to become involved in the development process.

A final group, but one of particular significance in the ElA process, includes the various consultants, advocates and advisers who participate in the EIA and the planning and development processes. Such agents are often employed by developers; occasionally they may be employed by local groups, environmental groups and others to help to mount opposition to a proposal. They may also be employed by regulatory bodies to help them in their examination process. Environmental and planning consultancies carry out most of the EIA work, supported by smaller consultancies specializing in such issues as archaeology, noise, health and socio-economic impacts. There has been a massive growth in the number of environmental consultancies in the UK (Figure 3.2). The numbers have increased by over 400 per cent since the mid-1980s, and it has been estimated that clients in the year 2008 were spending approximately £1.5 billion on their services (ENDS 2009). Major factors underpin- ning the consultancy growth included the advent of the UK Environmental Protection Act (EPA) in 1990, EIA regulations, the growing UK business interest in environmental management systems (e.g. BS 7750, ISO 14001), and a whole raft of EC regulations including on SEA, eco-auditing, and the Water Framework Directive. Tables 3.1 and 3.2 provide a summary of skills in demand and the main work areas of work for UK environmental consultancies. EIA and planning is a specialism in considerable demand, and the area was also

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3.2.6 Agency interaction

3.3 EIA regulations: an overview

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Figure 3.2
Year

Increasein the number of environmental consultancies in the UK(1950-2010)
Source: Based on ENDS 1993, 1997, 2001 and website

mentioned by about a quarter of all respondents to the Environmental Data Services (ENDS) survey as a major area of activity. Further characteristics of recent consultancy activity are discussed in Chapter 8.

The various agencies outlined here represent a complex array of interests and aims, any combination of which may come into play for a particular development. This array has several dimensions, and within each there may be a range of often conflicting views. For example, there may be conflict between local and national views, between the interests of profit maximization and those of environmental conservation, between short-term and long-term perspectives and between corporate bodies and individuals. The agencies are also linked in various ways. Some links are

Table 3.1 Skills in demand by UK environmental consultancies (2008)
Table 3.2 Environmental consultants' main professional activities (2009)

Specialism	%
Waste management	62
Energy management	53
Sustainable development	52
EIA and planning	50
Environmental management and auditing	49
Water and waste management	46
GHG and carbon management	44
Pollution prevention and control (IPPC)	44
Health, safety and environmental management	42
Contaminated land and remediation	40
Renewable energy and clean energy	40
Air pollution and control	38
Corporate policy. CSR and communications	37
Ecology and nature conservation	35

Activity %

Hydrology and hydrogeology 30
Public affairs and stakeholder communication 29
Hazard risk management 28
Acoustics 22
Process engineering 20

Environmental management 44
Waste management/recycling 35
Environmental protection/regulation 29
Health, safety and environmental management 26
Sustainable development 24
Auditing/verification 23
Environmental education/training 23
Environmental impact assessment (inc. EIA, SEA 23
and SA) and planning
Carbon management 19
Energy 19
Climate change and GHG management 18
Pollution control 18
Risk assessment 18
Corporate policy, CSR and communications 16

Source: ENDS 2010
Source: ENDS 2009

statutory, others advisory. Some are contractual, others regulatory. The EIA regulations and guid- ance provide a set of procedures linking the various actors discussed, and these are now outlined.

In the UK, EC Directive 85/337 was implemented through over 40 different secondary regulations under Section 2.2 of the European Communities Act 1972. The large number of regulations was symptomatic of how EIA has been implemented in the UK. Different regulations apply to projects covered by the planning system, projects covered by other authorization systems and projects not covered by any authorization system but still requiring EIA. Different regulations apply to England, and the Devolved Administrations (DA) of Wales, Scotland and Northern Ireland. The introduction of various revisions to the regulations from 1999 onwards (the most recent being those of 2011), to implement the amended EC Directive,

provided opportunities for some tidying up of the list, but as Table 3.3 shows, there are still many regulations to ensure that all of the Directive's requirements are met. The regulations are supple- mented by an array of EIA guidance from govern- ment and other bodies (Table 3.4). In addition, the Planning and Compensation Act 1991 allows the government to require EIA for other projects that fall outside the Directive.
In contrast to the US system of EIA, the EC EIA Directive applies to both public and private sector development. The developer carries out the EIA, and the resulting EIS must be handed in with the application for authorization. In England, most of the developments listed in Annexes I and II of the Directive fall under the remit of the planning system, and are thus covered by the Town and Country Planning (EIA) Regulations 2011 (the T&CP Regulations), previously the Town and Country Planning (Assessment of Environmental Effects (AEE)) Regulations 1988 and 1999. Over time various incremental additions and amend- ments have been made to the T&CP Regulations to plug loopholes and extend the remit of the regulations, for instance:
Table 3.3 Key UK EIA regulations and dates of implementation

UK regulations for projects subject to the Town and Country Planning system

England
Town and Country Planning (EIA) Regulations 2011
Town and Country Planning (General Permitted Development} Order 1995

Wales

Under review

Scotland
Town and Country Planning (EIA) (Scotland) Regulations 2011

Northern Ireland
Under review

UK EIA regulations for projects subject to alternative consent systems

Agriculture
Environmental Impact Assessment (Agriculture} (England} (no. 2) Regulations 2006

Afforestation
Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999 Environmental Impact Assessment (Forestry) Regulations (Northern Ireland} 1999 Environmental Impact Assessment (Forestry) Regulations (Scotland} 1999
Infrastructure/major projects
Infrastructure Planning (EIA) Regulations 2009

Land drainage improvements
Environmental Impact Assessment (Land Drainage Improvement Works) Regulations 1999 Land Drainage {EIA) (Scolland) RegulaUons 1999
Drainage (EA) Regulations (Northern Ireland) 2001

Fish farming
Environmental Impact Assessment (Fish Farming in Marine Waters} Regulations 1999
Environmental Impact Assessment (Fish Farming in Marine Waters) Regulations (Northern Ireland) 2006

Trunk roads and motorways
Highways (AEE) Regulations 1999
Roads {EIA) Regulations (Northern Ireland) 1999

Railways, tramways, inland waterways and works interfering with navigation rights
Transport and Works (AEEs) 2000

Ports and harbours, and marine dredging
Environmental impact assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) (England and Northern Ireland) Regulations 2007
Harbour Works (EIA) Regulations 1999
Harbour Works (AEE) Regulations (Northern Ireland) 1990

Power stations, overhead power lines and long-distance oil and gas pipeline
Eleciricity Works (AEE) (England and Wales) Regulations 2000 Eleciricity Works (EIA) (Scotland) Regulations 2000
Pipeline Works (EIA) Regulations 2000
The Nuclear Reactors (EIA for Decommissioning) Regulations 1999 The Gas Transporter Pipeline Works {EIA) Regulations 1999
Offshore Petroleum Production and Pipelines (AEE) Regulations 1999

Water Resources
The Water Resources {EIA) (England and Wales) Regulations 2003
Table 3.4 UK government EIA procedural guidance

DoE 1991. Monitoring environmental assessment and planning. London: HMSO
DoE 1994. Evaluation of environmental information for planning projects: a good practice guide. London: HMSO
DoE 1995. Preparation of environmental statements for planning projects that require environmental assessment. London: HMSO
DoE 1996. Changes in the quality of environmental statements for planning pro1ects. London: HMSO
Environment Agency 1996. A scoping handbook for projects. London: HMSO
DETR 1997. Mitigation measures in environmental statements. London: HMSO
Scottish Executive Development Department 1999b. Planning advice note 58. Edinburgh: SEDD
National Assembly for Wales 1999. Circular 11/99 Environmental impact assessment. Cardiff:

National Assembly
Planning Service (Northern Ireland) Development control advice note 10 1999. Belfast: NI Planning Service.
DETR 2000. Environmental impact assessment: a guide to the procedures. London: DCLG
DCLG 2006. Circular and guide to good practice. London: DCLG
DfT 2007b. Guidance on transport assessment (GTA). London: DfT
DfT 2011. Design manual for roads and bridges. London: DfT
Scottish Government 201 1a. Circular 3/2011: The Town and Country Planning Environmental Impact Assessment (Scotland} Regulations 2011. Edinburgh: Scottish government. (Also available as EasyRead Guide}.
DCLG 2011. Guidance on the Environmental Impact Assessment (EIA) Regulations 2011 for England. London: DCLG

- to expand and clarify the original list of projects for which EIA is required (e.g. to include motorway service areas and wind farms, and more recently to add carbon capture and storage projects);
- to require EIA for projects that would other- wise be permitted (e.g. land reclamation, waste water treatment works, projects in Simplified Planning Zones);
- to require EIA for projects resulting from a successful appeal against a planning enforce- ment notice;
- to allow the relevant Secretary of State (SoS) to direct that a particular development should be subject to EIA even if it is not listed in the regulations; and
- to be consistent with various EC and UK legal rulings, for instance about screening processes and documentation.

Other types of projects listed in the EC Directive require separate legislation, since they are not governed by the planning system. Of the various tramport projects, local highway developments and airports are dealt with under the T&CP Regulations by the local planning (highways) authority, but motorways and trunk roads proposed and regu- lated by the Department for Transport (DfT) fall under the Highways (Assessment of environmental effects) Regulations 1999. Applications for harbours are regulated by the Dfr under the various Harbour Works (EIA) Regulations. New railways and tram- ways require EIA under the Transport and Works (AEE) procedure 2000.
Energy projects producing less than 50 MW are regulated by the local authority under the T&CP Regulations. Those of SO MW or over, most electricity power lines, and pipelines (in Scotland as well as in England and Wales) are controlled by the Department of Energy and Climate Change (DECC) under the various Electricity and Pipeline Works (EIA) Regulations 2000.
New lllnd drainage works, including flood defence and coastal defence works, require plan- ning permission and are thus covered by the T&CP Regulations. Improvements to drainage works carried out by the Environment Agency and other drainage bodies require EIA through the EIA (Land Drainage Improvement Works) Regulations, which are regulated by the Department for Environment, Food and Rural Affairs (DEFRA). Forestry projects require EIA under the EIA (forestry) Regulations 1999. Marini! fish fimning within 2 km of the coast of England, Wales or Scotland requires a lease from the Crown Estates Commission, but not planning permission. For these developments, EIA is required under the EA (Fish farming in Marine Waters) Regulations 1999.
Many other developments in Scotland, Wales and Northern Ireland arc increasingly being covered by country-specific legislation. For example the T&:CP (EIA) (Scotland) Regulations 2011 have also been revised recently, and provide an interesting parallel system with the regulations for England. They also include a very useful User Guide/EasyRead short version for the busy reader (see Table 3.4). Wales is also developing its own separate T&CP (EIA) Regulations.

As will be discussed in Chapter 8, about 60-70 per cent of all the EIAs prepared in the UK fall under the T&CP Regulations, about 10 per cent fall under each of the EIA (Scotland) Regulations and the Highways (EIA) Regulations; almost all the rest involve land drainage, electricity and pipeline works, forestry projects in England and Wales and planning-related developments in Northern Ireland.

The enactment of this wide range of Eli\ regulations has made many of the early concerns regarding procedural loopholes (e.g. CPRE 1991, Fortlage 1990) obsolete. However, several issues still remain - not least the sheer complexity of this array of regulation. First is the ambiguity inherent in the term project. An example of this is the EIA procedures for electricity generation and transmission, in which a power station and the transmission lines to and from it are seen as separate projects for the purposes of EIA, despite the fact that they arc inextricably linked (Shcate 1995; sec also Section 9.2). Another example is the division of road construction into several separate projects for planning and EIA purposes even though none of them would be independently viable.

Regulations 1999 and the Town and Country Planning (AEE) Regulations 1988}

The T&CP Regulations implement the EC Directive for those projects that require planning permission in England (Wales now has separate regulations). They arc the central form in which the Direc- tive is implemented in the UK; the other UK EIA regulations were established to cover projects that are not covered by the T&CP Regulations. As a result, the T&CP Regulations are the main focus of discussions on EIA procedures and effectiveness. This section presents the procedures of the T&CP Regulations. Figure 3.3 summarizes these pro- cedures; the letters in the figure correspond to the letters in bold preceding the explanatory para- graphs below. Section 3.5 considers other main EIA regulations as variations of the T&CP Regulations and Section 3.6 comments on the changes follow- ing from the amended EC Directive.

The original T&CP Regulations were issued in July 1988. Guidance on the Regulations followed soon after; DoE Circular 15/88 (Welsh Office Circular 23/88) was aimed primarily at local plan- ning authorities; a guidebook entitled Environmental assessment: a guide to the procedures (DoE 1989), was aimed more at developers and their advisers. Further DoE guidance on good practice in carrying out and reviewing EIAS was published in 1994 and 1995 (DoE 1994a, b, 1995) and in 1997 (DETR). The revised 1999 T&CP Regulations were accompanied by new circulars on EIA (DETR 1999; Scottish Executive Development Department 1999, NAFW 1999), which give comprehensive guidance on the Regulations. A valuable guidebook, Environmental impact assessment: a guide to the procedures (DETR 2000) was also issued. Guidance 011 the Environ- mental Impact Assessment (EIA) Regulations 2011 for England (DCLG 201 I b), and the parallel document for Scotland, now provide the latest versions in this stream of very useful documents. The circulars and other government guidance are strongly recom- mended reading. However, only the regulations are mandatory: the guidance interprets and advises, but cannot be enforced.

The T&CP Regulations require EIAs to be carried out for two broad categories of project, given in Schedules 1 and 2. These schedules correspond very closely to Annexes I and II in the amended EC Directive, as outlined in Table 2.4 and detailed in Appendix 1.1Schedule 1 has very minor wording changes from Annex I, plus the switch of Annex I, 1.20, long overhead electrical power lines, to the Electricity Works (AEE) Regulations 2000 (S1 1927). The decommissioning of nuclear power stations and reactors is also covered by separate EIA regulations in the UK. Schedule 2 has only very minor modifications from Annex II; primarily in (see Table 3.4). Wales is also developing its own separate T&CP (EIA)

Figure 3.3

Summary of T&CP Regulations in EIA procedure
Source: Based on DETR 2'000
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min

21 days

max
16 weeks

Permission given

J. Permission refused

separate category (p) for motorway service areas, and a few other categories are split or relocated. Schedule 2.12 also includes an additional category
(f) for golf courses and associated developments. For Schedule 1 projects, EIA is required in every case. A Schedule 2 project requires EIA if it is deemed 'likely to give rise to significant environ- mental effects'.

The 'significance' of a project's environmental effects is determined on the basis of a set of applicable thresholds and criteria for Schedule 2 development (see Appendix 2), and the selection criteria in Schedule 3 of the Regulations (sec I able 3.5). Three categories of criteria arc listed in Schedule 3 (DETR 2000; DCLG 201 la):

whether it is a development of more than local importance [for example, in terms of physical scale];

- whether the development is proposed for a particularly environmentally sensitive or vul- nerable location [for example, a national park or a site of special scientific interest]; and
- whether the development is likely to have unusually complex and potentially hazardous environmental effects [for example, in terms of the discharge of pollutants].

The third category is designed to help in determining whether the interactions between the first two categories (i.e. between a development and its environment) are likely to be significant. A project constitutes Schedule 2 development for EIA when: (a) it meets criteria or exceeds thresholds listed in the second column of the Schedule 2 table (see Appendix 2); or (b) is located in, or partly in, a 'sensitive area', as defined in the regulations (see Table 3.5). The more environmentally sensitive the location, the more likely it is that the effects will be significant and require EIA.

Screening criteria have raised many issues over the life of the UK EIA regulations, including giving rise to several celebrated legal cases - many of which are covered in Section 8.6, Chapter 8. These include, for instance, cases about dealing with extensions to projects, multi-stage consents, and the extent to which proposed project mitigation measures can be taken into account in screening decisions.

The 2011 Regulations have responded on many of the legal issues raised.

Table 3.5 Selection criteria for screening Schedule 2 development

1 Characteristics of development

The characteristics of development must be considered having regard, in particular, to:
(a) the size of the development;
(b} the cumulation with other development; (c} the use of natural resources;
(d} the production of waste;
(e) pollution and nuisances;
(f} the risk of accidents, having regard in particular to substances or technologies used.

2 Location of development

The environmental sensitivity of geographical areas likely to be affected by development must be considered, having regard, in particular, to:
(a) the existing land use; (i) wetlands;

(ii)

coastal zones;

(b} the relative abundance, quality and regenerative capacity of natural resources in the area;
(c} the absorption capacity of the natural environment. paying particular attention to the following areas
(iii} mountain and forest areas;
(iv)
nature reserves and parks;

(v)
areas designated by Member States pursuant to Council Directive 2QQg/147/EC on the conservation of wild birds1'l and Council Directive g2;43;EEC on the conservation of natural habitats and of wild fauna and floral2l;

(vi)
areas in which the environmental quality standards laid down in EU legislation have already been exceeded;

(vii)
densely populated areas;

(viii} landscapes of historical, cultural or archaeological significance

3
Characteristics of the potential impact

The potential significant effects of development must be considered in relation to criteria set out under paragraphs 1 and 2 above, and having regard, in particular, to:
(a)
the extent of the impact (geographical area and size of the affected population);

(b} the transfrontier nature of the impact;
(c} the magnitude and complexity of the impact; (d} the probability of the impact;
(e} the duration, frequency and reversibility of the impact.

Source: DCLG 2011a
Notes: (1) O.J. no. L 20, 26.1.2010, p. 7. (2) 0.J. no. L 206, 22.7.1992, p. 7.

Schedule 2.13 has been amended so that the thresholds in Schedule 2 apply to the develop- ment as a whole once changed or extended, and not just to the change or extension. for example, the construction of a 0.2 ha exten- sion to an industrial estate may not have previously qualified for EIA by virtue of falling below the relevant 0.5 ha threshold. Now, this extension must be considered with the original development. If the latter was 0.4 ha, this would take the combined development over the Eli\ threshold size of 0.6ha.

- l"he 2011 Regulations also include amend-

ments in relation to a European Court of Justice (ECJ) preliminary ruling on screening decisions, known as the Mellor case, which now requires reasons for a negative EIA screening decision to be made available on request.

- Further to another ECJ ruling on multi-stage consents, the 2011 Regulations provide for the limitation to the requirement for subse- quent applications to be subject to screening in those cases where the development is likely to have significant effects on the environ- ment, which were not identified at the time the initial planning permission was granted.

- New categories for carbon capture and A.

A developer may decide that a project requires EIA under the T&CP Regulations, or may want to carry out an Eli\ even if it is not required. If the developer is uncertain, the LP/\ can be asked for an opinion ('screening opinion') on whether an EIA is needed. To do this the developer must provide the LPA with a plan showing the development site, a description of the proposed development and an indication of its possible environmental impacts. The LPA must then make a decision within three weeks. The LPA can ask for more information from the developer, but this does not extend the three week decision-making period.

B.

If the LPA decides that an EIA is needed but the developer disagrees, the developer can refer the matter to the SoS for a ruling.2 The SoS must give a decision within three weeks. If the SoS decides that an EIA is needed, an explanation is needed; it is published in the formwl of Planning and Environment Law. No explanation is needed if no EIA is required. The SoS may make a decision if a developer has not requested an opinion, and may rule, usually as a result of information made available by other bodies, that an EIA is needed where the LPA has decided that it is not needed.

storage (CCS) have been included in both Schedules.

The 2011 Regulations also include the simpli- fication of the thresholds from the more com- prehensive applicable and indicative thresholds and criteria introduced under the 1999 Regulations, to applicable thresholds and criteria only. As can be seen in Appendix 2, these are largely spatially based ('the area of the development exceeds 0.5 ha'; 'the area of new floorspace exceeds 1000 square metres'). A current interesting issue (at the time of going to press) concerns a widening of screening actions to more cases of project demolition/ decommissioning. The European Court ruled in 2011 that demolition work comes within the scope of the EIA Directive; the effect is that where demolition works are likely to have significant environmental effects (for instance demolition of a listed building), the LPA must issue a screening opinion on whether EIA is required. Similarly, applicants who intend to demolish a structure must consider whether this may have significant environmental effects and require EIA. If this is the case the applicant must ask for a screening opinion. Finally, reflecting the continuing momentum in the evolving nature of developments, and EU and domestic legislation, there is a commitment to a further review of the 201 I Regulations within five years of their introduction!

If the LPA decides that no EIA is needed, the application is processed as a normal planning application. If instead the LPA decides that an Eli\ is needed, it must explain why, and make both the developer's information and the decision publicly available. In all cases the LPA must explain clearly and precisely the full reasons for its conclusion whether EIA is required or not. If the LPA receives a planning application without an EIA when it feels that it is needed, the LP/\ must notify the developer within three weeks, explaining why an EIA is needed. The developer then has three weeks in which to notify the LPA of the intention either to prepare an EIS or to appeal to the Secretary of State (SoS); if the developer does not do so, the planning application is refused.

Schedule 4 of the T&CP Regulations, which is shown in Table 3.6, lists the information that should be included in an EIA. Schedule 4 interprets the requirements of the EIA Directive Annex IV according to the criteria set out in Article 5 of the Directive, namely:

Member States shall adopt the necessary meas- ures to ensure that the developer supplies in an appropriate form the information specified in Annex IV inasmuch as:

(a) the Member States consider that the information is relevant to a given stage of the consent procedure and to the specific characteristics of a particular project or type of project and of the environmental features likely to be affected;

(b) the Member States consider that a devel- oper may reasonably be required to compile this information having regard inter alia to current knowledge and methods of assessment.

Table 3.6 Content of EIS required by the T&CP Regulations (2011)- Schedule 4 Under the definition in Regulation 2.1, 'environmental statement' means a statement:

(a)

that includes such of the information referred to in Part 1 of Schedule 4 as is reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile, but (a)

a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;

(b)

a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used;

(c)

an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.

(a)

the existence of the development;

(b)

the use of natural resources;

(c)

the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment.

{b) that includes at least the information referred to in Part 2 of Schedule 4.

Description of the development, including, in particular:

2

An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental ettects.

3

A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.

4

A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:

5

A description of the measures envisaged to prevent, reduce and, where possible, offset any significant adverse eHects on the environment.

6

A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.

7

An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

Part 2

1
A description of the development comprising information on the site, design and size of the development.

2
A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.

3
The data required to identify and assess the main effects which the development is likely to have on the environment.

4
An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.

5
A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.

C.
Until the implementation of the amended Directive in 1999, there was no mandatory requirement in the UK for a formal 'scoping' stage at which the LPA, the developer and other inter- ested parties could agree on what would be included in the EIA. Indeed, there was no require- ment for any kind of consultation between the developer and other bodies before the submission of the formal EIA and planning application, although guidance (DoE 1989) did stress the benefits of early consultation and early agreement on the scope of the EIA. The 1999 and subsequent Regulations enable a developer to ask the LPA for a formal 'scoping opinion' on the information to be included in an EIS - in advance of the actual planning application. This allows a developer to be clear on LPA views on the anticipated key significant effects. The request must be accompa- nied by the same information provided for a screening opinion, and may be made at the same time as for the screening opinion. The LPA must consult certain bodies (see D), and must produce the scoping opinion within five weeks. The time period may be extended if the developer agrees. There is no provision for appeal to the SoS if the LPA and developer disagree on the content of an EIS. But if the LPA fails to produce a scop- ing opinion within the required timescale, the developer may apply to the SoS (or Assembly) for a scoping direction, also to be produced within five weeks, and also to be subject to consultation 3.4.3 Statutory and other consultees

D.
First, when an LPA determines that an EIA is required, it must inform the statutory consultees of this. Current consultation bodies in England include the relevant planning authority, Natural England, the Environment Agency and more recently the Marine Management Organization (primarily in relation to projects with potential marine impacts). The consultees in turn must make available to the developer, if so requested and at a reasonable charge, any relevant environmental information in their possession. For example, Natural England might provide information about the ecology of the area. This docs not include any confidential information or information that the consultees do not already have in their possession.

E.
Second, once the EIS has been submitted, the LPA or developer must send a free copy to each of the statutory consultees. The consultees may make representations about the EIS to the LPA for at least two weeks after they receive the EIS. The LPA must take account of these representations when deciding whether to grant planning permission. rhe developer may also contact other consultees and the general public while preparing the EIS. The government guidance explains that these bodies may have particular expertise in the subject or may highlight important environmental issues that could affect the project. Although the devel- oper is under no obligation to contact any of these groups, again the government guidance stresses the benefits of early and thorough consultation. 3.4.4

F.
The government gives no formal guidance about what techniques and methodologies should be used in EIA, noting only that they will vary depending on the proposed development, the

Schedule 4 of the
T&CP
In Schedule 4, the information required in Annex IV has been interpreted to fall into two parts. l'hc EIS must contain the information specified in Part 2, and such relevant information in Part 1 'as is reasonably required to assess the effects of the project and which the developer can reasonably be required to compile'. This distinction is important: as will be seen in Chapter 8, the EISs prepared to date have generally been weaker on Part 1 information, although this includes such important matters as the alternatives that were considered and the expected wastes or emissions from the development. In addition, in Appendix 5 of the guidebook (DETR 2000), there is a longer checklist of matters that may be considered for inclusion in an EIA: this list is for guidance only, but it helps to ensure that all the possible significant effects of the development are con- sidered (Table 3.7).
with certain bodies. The checklist (DETR 2000) provides a useful aid to developer-LPA discussions (see rablc 3.7).

Under the T&CP Regulations, a number of statutory consultees are involved in the EIA process, as noted in Section 3.2. These bodies are involved at two stages of an EIA, in addition to possible involvement in the scoping stage.

Table 3.7 Checklist of matters lo be considered for inclusion in an environmental statement

This checklist is intended as a guide to the subjects that need to be considered in the course of preparing an environmental statement. It is unlikely that all the items will be relevant to any one project.
The environmental effects of a development during its construction and commissioning phases should be considered separately from the effects arising while it is operational. Where the operational life of a development is expected to be limited, the effects of decommissioning or reinstating the land should also be considered separately.
Section 1: Information describing the project
1 .1 Purpose and physical characteristics of the project, including details of proposed access and transport arrangements, and of numbers to be employed and where they will come from.
discharges 1o waler; emissions 1o air; noise; vibration; light; heat; radiation; deposits/residues to land and soil; others.
1 .4 Main alternative sites and processes considered, where appropriate, and reasons for final choice.

Section 2: Information describing the site and its environment Physical features
2.
1 Population - proximity and numbers. 2.2
Flora and fauna (including both habitats and species) - in particular, protec1ed species and their habitats.

2.3
Soil: agricultural quality, geology and geomorphology.

2.4
Water: aquifers, wa1ercourses, shoreline, including the type, quan1ity, composition and strength of any existing discharges.

2.5
Air: climatic factors, air quality, etc.

2.6
Architectural and historic heri1age, archaeological sites and features, and other material assets.

2.7
Landscape and topography.

2.8
Recreational uses.

2.9
Any other relevant environmental features.

2.10
Where applicable, the information considered under this section should include all relevant statutory designations such as national nature reserves, sites of special scientific interest, national parks, areas of outstanding natural beauty, heritage coasts, regional parks, country parks and designated green belt, local nature reserves, areas affected by tree preservation orders, water protection zones, conservation areas, listed buildings, scheduled ancient monuments and designated areas of archaeological importance. It should also include references to relevant national policies (including Planning Policy Guidance (PPG) notes) and lo regional and local plans and policies (including approved or emerging development plans).

2.11
Reference should also be made to international designations, e.g. those under the EC 'Wild Birds' or 'Habitats' Directives, the

3.1
Change in population arising from the development, and consequential environment eHecls.

3.2
Visual effects of the development on the surrounding area and landscape.

3.3
Table

3.

7

Checklist

matters

lo

3.10
Physical effects of the developmen1, e.g. change in local topography, effect of earth-moving on stability, soil erosion, etc.

3.11
Effects of chemical emissions and deposits on soil of site and surrounding land.

3.12
Land-use/resource effects: •
quality and quantity of agricultural land to be taken;

•
sterilization of mineral resources;

- other alternative uses of the site, including the 'do nothing' option;
- effect on surrounding land uses including agriculture;
- waste disposal.

3.13 Effects of development on drainage pattern in the area.

3.14 Changes to other hydrographic characteristics, e.g. groundwater level, watercourses, flow of underground water.

3.15 Effects on coastal or estuarine hydrology.

3.16 Effects of pollutants, waste, etc. on water quality.

3.17 Level and concentration of chemical emissions and their environmental effects.

3.18 Particulate matter.

3.19 Offensive odours.

The policy framework
Biodiversity Convention and the Ramsar Conven1ion.

Section 3: Assessment of effects
Including direct and indirect, secondary, cumulative, short-, medium- and long-term, permanent and temporary, positive and negative effects of the project.
Effects on human beings, buildings and man-made features
of

be
Effects on land
Effects on water
Effects on air and climate
3.
'20 Any other climatic effects.

Other indirect and secondary effects associated with the project
3.'21 Effects from traffic (road, rail, air, water) related to the development.
3.'22 Effects arising from the extraction and consumption of materials, water, energy or other resources by the development.
3.'23 Effects of other development associated with the project, e.g. new roads, sewers, housing, pcwer lines, pipelines, telecommunications, etc.
3.'24 Effects of association of the development with other existing or proposed development.
3.
'25 Secondary effects resulting from the interaction of separate direct effects listed above.
4.1

Where significant adverse effects are identified, a description of the measures to be taken to avoid, reduce or remedy those effects, e.g.: (a)
site planning;

(b)
technical measures, e.g.:

- process selection;
- recycling;
- pollution control and treatment;
- containment (e.g. bunding of storage vessels).

(c)
aesthetic and ecological measures, e.g.:

- mounding;
- design, colour, etc.;
- landscaping;
- tree plantings;
- measures to preserve particular habitats or create alternative habitats;
- recording of archaeological sites;
- measures to safeguard historic buildings or sites.

Section 4: Mitigating measures

4.
'2 Assessment of the likely effectiveness of mitigating measures.

Section 5: Risk of accidents and hazardous development

5.1 Risk of accidents as such is not covered in the EIA Directive or, consequently, in the implementing Regulations. However, when the proposed development involves materials that could be harmful to the environment (including people) in the event of an accident, the environmental statement should include an indication of the preventive measures that will be adopted so that such an occurrence is not likely to have a significant effect. This could, where appropriate, include reference to compliance with Health and Safety legislation.

5.
'2 There are separate arrangements in force relating to the keeping or use of hazardous

substances and the HSE provides local planning authorities with expert advice about risk assessment on any planning application involving a hazardous installation.

5.3 Nevertheless, it is desirable that, wherever pcssible, the risk of accidents and the general environmental effects of developments should be considered together, and developers and planning authorities should bear this in mind.
Source: DETR '2000

receiving environment and the information available, and that predictions of effects will often have some uncertainty attached to them.

21 days of the LPA's receipt of the planning application.

I. Before making a decision about the planning application, the LPA must collect written representations from the public within three weeks of the receipt of the planning application, and from the statutory consultees at least two weeks from their receipt of the EIS. It must wait at least 14 days after receiving the planning application before making a decision. In contrast to normal planning applications, which must be decided within eight weeks, those accompanied by an EIS must be decided within 16 weeks. If the LPA has not made a decision after 16 weeks, the applicant can appeal to the SoS for a decision. The LPA cannot consider a planning application invalid because the accompanying EIS is felt to be inadequate: it can only ask for further information within the 16-week period.
In making its decision, the LPA must consider the EIS and any comments from the public and statutory consultees, as well as other material considerations. The environmental information is only part of the information that the LPA considers, along with other material considera- tions. The decision is essentially still a political one, but it comes with the assurance that the project's environmental implications are understood. f'he I.PA may grant or refuse permission, with or without conditions. It is important for I.l'As to consider how mitigation measures proposed in an ES are likely to be secured; they may be included in conditions attached to a planning permission; they can also be secured through enforceable plan- ning obligations. Further to the changes resulting from the EC Directive the LPA must, in addition to the normal requirements to notify the appli- cant, notify the sos and publish a notice in the local press, giving the decision, the main reasons on which the decision was based, together with a description of the main mitigation measures.
j. If an I.PA refuses planning permission, the developer may appeal to the SoS, as for a normal planning application. The SoS may request further information before making a decision.

and

that predictions

of

effects

4 Electricity Works (AEE) Regulations 2000.

5 Pipeline Works (Environmental Impact Assess- ment) Regulations 2000.

6 Environmental Assessment (Forestry) Regula- tions 1999.

Infrastructure Planning (Environmental Im- pact Assessment) Regulations 2009. 3.5.1
EIA (Scotland) Regulations: including The Town and Country Planning (EIA) (Scotland) Regulations 2011
3.5.2
Highways (AEE) Regulations 1999

The EIA (Scotland) Regulations are broadly similar to those for England. They implement the Directive for projects that are subject to planning permission, but also cover some land drainage and trunk road projects. There is separate guidance on the Scottish Regulations (see Table 3.2). For some projects (for example, for the decommissioning of nuclear power stations), Scotland is included in regula- tions that also apply to other parts of the UK. In Northern Ireland, the Directive is implemented for projects subject to planning permission by the Planning (EIA) Regulations (Northern Ireland) 1999 (currently being revised).

The T&CP (EIA) (Scotland) Regulations were amended roughly in line with the English Regula- tions and for similar reasons. The commentary on the 2011 Regulations notes that:

The existing I 999 Regulations had been repeatedly amended (12 times in 11 years) to take into account case law from domestic and European Courts, and changes to the Directive and/or domestic legislation. This made the 1999 Regulations increasingly complex and difficult to follow. The Scottish Parliament's subordinate legislation committee called for the Regulations to be consolidated in order to make them more accessible. (Scottish Government 2011b)

Under the Scottish Regulations, screening for Schedule 2 projects is on a case by case taking into account the key selection criteria: characteristics of the development, location of the development, and characteristics of the potential impacts. LPAs are encouraged to use checklists, including the one on the Scottish government's (Planning) EIA web page.

The Highways (AEE) Regulations apply to motor- ways and trunk roads proposed by the Department of Transport (DoT). The regulations are approved under procedures set out in the Highways Act 1980, which require the SoS for Transport to pub- lish an EIS for the proposed route when draft orders for certain new highways, or major improve- ments to existing highways, are published. The SoS determines whether the proposed project comes under Annex I or Annex II of the Directive, and whether an EIA is needed. EIA is mandatory for projects to construct new motorways and certain other roads, including those with four or more lanes, and for certain road improvements. The regulations require an EIS to contain:

- a description of the published scheme and its site;
- a description of measures proposed to mitigate adverse environmental effects;
- sufficient data to identify and assess the main effects that the scheme is likely to have on the environment; and
- a non-technical summary. 3.5.3

Environmental Impact Assessment (Land Drainage Improvement Works) Regulations 1999 3.5.4
Electricity Works (AEE) Regulations 2000; Nuclear Reactors (EIA for Decommissioning) Regulations 1999

Before 1993, the requirements of the Highways (AEE) Regulations were further elaborated in DoT standard AD 18/88 (DoT 1989) and the Manual of E11viro11111c11tal Appraisal (DoT 1983). In response to strong criticism, 4 particularly by the SACTRA (1992), these were superseded in 1993 by the Design manual for roads and bridges (DMRB), vol. II: Environmental assessment (DoT 1993). The manual proposed a three-stage EIA process and gave extensive, detailed advice on how these E!As should be carried out. DMRB (Dff 2011) provides the latest evolution of the guidance for road projects. Other very useful transport assessment documentation can be found on the DfT WebTAG Transport Analysis Guidance website, including Guidance on Transport Assessment (GTA) (DfT 2007a).

The EIA (Land Drainage Improvement Works) Regulations apply to almost all watercourses in England and Wales except public-health sewers. If a drainage body (including a local authority acting as a drainage body) determines that its proposed improvement actions arc likely to have a significant environmental effect, it must publish a description of the proposed actions in two local newspapers and indicate whether it intends to prepare an EIS. If it does not intend to prepare one, the public can make representations within 28 days con- cerning any possible environmental impacts of the proposal; if no representations are made, the drainage body can proceed without an EIS. If repre- sentations are made, but the drainage body still wants to proceed without an EIS, DEFRA (National Assembly in Wales) gives a decision on the issue at ministerial level.
The contents required of the EIS under these regulations are virtually identical to those under the T&CP Regulations. When the EIS is complete, the drainage body must publish a notice in two local newspapers, send copies to NE, the Envir- onment Agency (EA), the MMO and any other relevant bodies and make copies of the EIS avail- able at a reasonable charge. Representations must be made within 28 days and are considered by the drainage body in making its decision. If all objec- tions are then withdrawn, the works can proceed; otherwise the minister gives a decision. Overall, these regulations are considerably weaker than the T&CP Regulations because of their weighting in favour of consent, unless objections are raised, and their minimal requirements for consultation with environmental organizations.

The construction or extension of power stations exceeding 50 MW, and the installation of overhead power lines, requires consent from the relevant Sos (currently Department of Energy and Climate Change) under Sections 36 and 37 of the Elec- tricity Act 1989. The Electricity Works (EIA) Regula- tions 2000 is part of the procedure for applications under these provisions. EIA is required for:

- all thermal and nuclear power stations that fall under Annex I of the Directive (i.e. thermal

power stations of 300 MW or more, and nuclear power stations of at least 50 MW); and

- construction of overhead power lines of 220 KV or more and over 15 km in length. 3.5.5
The Pipeline Works (EIA) Regulations 2000; The Gas Transporter Pipeline Works (EIA) Regulations 1999; Offshore Petroleum Production and Pipelines (AEE) Regulations 3.5.6
Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999}

3.5.7
Infrastructure Planning (EIA) Regulations 2009

The regulations also require proposed power stations not covered by Annex I, and all overhead power lines of at least 132 KV, to be screened for EIA. Power stations of less than 50 MW are approved under the planning legislation, through the T&CP (EIA) Regulations. The Electricity Works Regulations allow a developer to make a written request to the SoS to decide whether an EIA is needed. The SoS must consult with the LPA before making a decision. When a developer gives notice that an EIS is being prepared, the SoS must notify the LPA or the principal council for the relevant area, NE, the EA and the MMO, in the case of a power station, so that they can provide relevant information to the applicant. The contents required of the EIS are almost

identical to those listed in the T&CP Regulations.
The regulations on decommissioning of nuclear power stations were added in 1999. Dismantling and decommissioning require the consent of the Health and Safety Executive (HSE). A licensee who applies for consent must provide the HSE with an EIS. The regulations apply also to changes to existing dismantling or decommissioning projects that may have significant effects on the environment.

The evolving array of regulations relating to pipelines reflects not only the growing importance of such development, but also the continuation of the fragmented UK approach to EIA legislation. rhe on-shore Pipeline Works, and the Gas Transporter Pipeline Works, Regulations apply to England, Wales and Scotland; the Offshore Petroleum Production and Pipelines Regulations apply to the whole of the UK. Oil and gas pipelines with a diameter of more than 800 mm and longer than 40 km come within Annex I of the Directive; those
that fall below either of these thresholds are in Annex II. For the latter, pipelines 10 miles long or less arc approved under the planning legislation. The rest fall under the above pipeline regulations, normally with determination by the relevant SoS in relation to associated consent and authoriza- tion procedures and to various criteria and thres- holds. For example, on-shore gas pipeline works in Annex II of the Directive may be subject to EIA if they have a design operating pressure exceeding 7 bar gauge or they either wholly or in part cross a sensitive area (e.g. national park).

Under the original EIA Directive and associated UK regulations, forestry E!As were limited to those projects where applicants wished to apply for a grant or loan, for afforestation purposes, from the Forestry Agency. The lack of EIA requirements for other forestry projects, the perceived vested inter- est of the then Forestry Agency as a promoter of forestry and the lack of EIA requirements for the Agency's own projects have all been criticized (e.g. by the CPRE; see CPRE 1991). The amended Direc- tive and associated UK legislation have subse- quently brought about some changes.
Afforestation and deforestation come under Annex II of the Directive. Under the above Regu- lations, anyone who proposes to carry out a forestry project that is likely to have significant effects on the environment must apply for consent from the Forestry Commission before starting work. Those who apply for consent will be required to produce an EIS. The Regulations include: affores- tation (creating new woodlands); deforestation (conversion of woodland to another use) and constructing forest roads and quarrying material to construct forest roads. Where projects are below
5 ha (afforestation) and 1 ha (others), they may be deemed unlikely to have significant effects on the environment, unless they arc in sensitive areas. Given the variability of sites and projects,
are almost identical to those required under the T&CP Regulations.

Context
As noted in Section 1.4.1, under the 2008 Planning Act (HMG 2008), a special subset of nationally signihcant infrastructure projects (NS!Ps) has been identified, with impacts to be examined by new procedures led by the Infrastructure Planning Commission (IPC) (to be merged with the UK Planning Inspectorate in 2012). NS!Ps include major energy projects, transport projects (road, rail and port), water and waste facilities - many of which were formally covered by some of the previously discussed regulations (especially high- ways, electricity, and pipelines). The IPC examin- ation involves the consideration of environmental impacts, as relevant, under the Infrastructure Planning (EIA) Regulations 2009. The EIA Regula- tions impose procedural requirements for carrying out EIA on certain NSIP proposals. For example, EIA is always required for NS!Ps such as nuclear power stations, but others, such as wind farms, only require EIA if they are likely to have significant effects on the environment by virtue of their nature, size or location. The role of the IPC under the EIA regulations includes:

- 'screening' proposals to determine whether they are EIA developments;
- 'scoping' proposals to advise the applicant what information should be provided within the environmental statement - involving seeking views from consultation bodies;
- facilitating the preparation of ESs by notify- ing consultation bodies about their duty to provide information and informing the applicant;
-

evaluating environmental information in the ES and any representations made about the environmental effects before making a decision;

the Forestry Commission considers applications •
on a case-by-case basis. An applicant who disagrees with the Forestry Commission's opinion may apply • to the relevant SoS for a direction. The contents required of an EIA under the Forestry Regulations
publicizing the IPC's screening and scoping opinions; and
publicizing any decision in relation to an application that has been accompanied by an ES (!PC 2010).
The !PC may not grant development consent • unless it has first taken account of the 'environ-
• mental information' (ES and/or any further information about the environmental effects of the
• development). It will not accept an application
if the supporting ES is considered inadequate, or • it is deemed to be an EIA development but is not accompanied by an ES. •
a description of the scheme or proposal; interpretation of the site settings and sur- roundings;
outline of alternatives and methods used in reaching a preferred opinion;
results of desktop and baseline studies where available;
methods to predict impacts and the signifi- cance criteria framework;
Screening
A proposal will be an EIA development if: the applicant notifies the !PC that it intends to submit an ES; the IPC adopts a screening opinion to the effect that the proposal is an EIA development; the SoS directs that it is an EIA development; or the proposal falls within Schedule I of the EIA Regulations. Many NS!Ps arc likely to fall within Schedule I, for which EIA is mandatory. Others that fall within Schedule 2 must be considered for EIA against 'selection criteria' specified in Schedule 3 of the EIA Regulations; this differs from proposals under the T&CP (EIA) Regulations 2011, which are considered for EIA against applicable thresholds and criteria. For others, and where the applicant has not notified an intention to submit an ES, they must request that the IPC adopts a screening opinion in respect of the proposed development. Ideally the applicant should provide information on the characteristics of the development, the location of the development and characteristics of the potential impacts. Following the submission of a screening request, the IPC must issue its screening opinion within 21 days.

Scoping
Before making an application for a development consent order, the applicant has the opportunity to ask the !PC for a formal 'scoping opinion' on the information to be included in the ES. When making the request, the applicant must provide as a minimum: a plan sufficient to identify the land involved; a brief description of the nature and purpose of the development and of its possible effects on the environment; and such other infor- mation or representations as the applicant may wish to provide. However it is common practice for applicants to provide a scoping report as part of their formal request for a scoping opinion. Ideally this should include:

- mitigation and residual impacts to be con- sidered;
- key topics covered as part of the scoping exercise; and
- an outline of the structure of the proposed ES. 3.6
Summary and conclusions on changing legislation

Before adopting a scoping opinion the IPC has a duty to consult the 'consultation bodies', as defined in the EIA Regulation. These bodies have 28 days to respond. The IPC must adopt a scoping opinion within 42 days of receiving a scoping re- quest; to date, these scoping opinions have tended to be long and detailed. Finally, all !PC project ElAs are made available on the !PC website.5

The original (and amended) EC EIA Directive has been implemented in the UK through an array of regulations that link those involved - developers, affected parties, regulators and facilitators - in a variety of ways. The T&CP (EIA) Regulations are central. Other regulations cover projects that do not fall under the English and Welsh planning systems, such as motorways and trunk roads, power stations, pipelines, land drainage works, forestry projects, and development projects in Scotland and Northern Ireland.
The original UK Regulations had a number of weaknesses, relating to the range of projects included in the ambit of the EIA procedures, approaches to screening, scoping, consideration of alternatives, mandatory and discretionary EIS content, public consultation and others. Directive 97I 11/EC, and subsequent amendments, has sought to address some of these issues that had arisen in the UK and other Member States.
UK regulations have been amended many times, partly in response to changes to the EC Directive and to domestic legislation, and partly also to case law from domestic and European Courts. The evolving UK Regulations replicate closely the four annexes of the amended EC Directive. This has brought a wider array of projects into the UK EIA system, has increased the number of mandatory categories and has led to some growth in EIA activity and EIS output. Screening procedures have been developed, and the consideration of scoping and alternatives now has a higher profile. There has been considerable rationalization of legisla- tion, most recently in the 2011 consolidation of the T&CP (EIA) Regulations, but the array is still wide and complex. EIA guidance is a particular strength of the UK system, and government publications, especially the relevant circulars and guide to the procedures, help to navigate the legislative array.

SOME QUESTIONS

The following questions are i11te11de,i to help the reader focus 011 the important issues of this c/Japter, and to start building some 1111dersta11ding of the UK agency and legislative context of EIA.

For a project with which you are familiar, identify the various sets of principal actors, and outline the potential areas of contlict between their interests with regard to the project.

2
How does EIA legislation, and the relevant key regulators, vary in England between (a) a Schedule 2 golf course project; (b) a motorway development; and (c) the decommissioning of a nuclear power station?

3
What is the role of statutory consultees in the EIA process?

4
Under the T&CP (EIA) Regulations, a Schedule 2 project requires EIA if it is deemed 'likely to give rise to significant environmental effects'. What criteria and thresholds are used to determine that significance?

S Outline some of the changes introduced in the T&CP (EIA) Regulations for England (2011). What were the key drivers behind the changes?

6
Over time the projects covered by EIA have grown in response to both new technology and changes in social and economic infrastructure. What new additions might you anticipate for inclusion in the next review of legislation by 2016?

7
Currently a separate EIA for decommissioning or dismantling of a project only applies to nuclear power stations and reactors in the UK. Examine the case for extending this requirement to other projects.

8
What is a 'screening opinion', and who provides it?

9
Identify any particularly innovative features associated with the Infrastructure Planning

(Eli\) Regulations 2009.

Notes

There are some discrepancies. For instance, power stations of 300 MW or more are included in Schedule 1, al1hough they actually fall under the Elec1ricity Works (AEE) Regulations, and all 'special roads' are included, although the regulations should apply to special roads under local authority jurisdiction.

2 Decisions were actually made by the relevant government office in the region concerned (or the Assembly) - subsequently disbanded in 2011. As will be discussed in Chapter 8, this led to some discrepancies where two or more offices made different decisions on very similar projects.

3 This includes enough copies for all the statutory consultees to whom the developer has not already sent copies, one copy for the LPA and several for the Secretary of State.

4 The criticism was well deserved. The circular's assertion that'... individual highway schemes do not have a significant effect on climatic factors and, in most cases, are unlikely lo have significant effects on soil or water' is particularly interesting in view of the cumulative impact of private transport on air quality.

5 IPC practice is developing fast and includes much more focus on pre-application activities, including the EIA process. There is also an important role for a Statement of Common Ground (SOCG) between the developer and the LPAs, and the production of separate Local Impact Reports (LIRs) by the relevant LPAs.

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Part 2

••

Process

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69 Regent Street, Wellington, Telford, Shropshire TE1 1PE.

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4
Starting up: 4.1
Introduction

4.2
Managing the EIA process 4.2.1
1 The EIA team

4.2.2
The style of the EIA process

early stages
••

This is the first of four chapters that discuss how an EIA is carried out. The focus throughout is on both the procedures required by UK legislation and the ideal of best practice. Although Chapters 4-7 seek to provide a logical step-by-step approach through the EIA process, there is no one exclusive approach. Every EIA process is set within an institutional context, and the context will vary from country to country (see Chapter 10). As already noted, even in one country, the UK, there may be a variety of regulations for different projects (see also Chapter 9). The various steps in the process can be taken in different sequences. Some may be completely missing in certain cases. The process should also not just be linear but build in cycles, with feedback from later stages to the earlier ones.

Chapter 4 covers the early stages of the EIA process. rhese include setting up a management process for the EIA activity, clarifying whether an EIA is required at all ('screening') and an outline of the extent of the EIA ('scoping'), which may involve consultation between several of the key actors outlined in Chapter 3. Early stages of EIA should also include an exploration of possible alternative approaches for a project. Baseline studies, setting out the parameters of the develop-
ment action (including associated policy positions) and the present and future state of the environ- ment involved, are also included in Chapter 4. However, the main section in the chapter is devoted to impact identification. This is important in the early stages of the process, but, reflecting the cyclical, interactive nature of the process, some of the impact identification methods dis- cussed here may also be used in the later stages. Conversely, some of the prediction, evaluation, communication and mitigation approaches dis- cussed in Chapter S can be used in the early stages, as can the participation approaches outlined in Chapter 6. The discussion in this chapter starts, however, with a brief introduction to the man- agement of the EIA process.

Environmental impact assessment is a management- intensive process. EIAs often deal with major (and sometimes poorly defined) projects, with many wide-ranging and often controversial impacts. It is important that the EIA process is well managed. This section discusses some of the inter-related aspects of such management: the EIA team, the style of the EIA process, and costs and resourcing.

The EIA process invariably involves an inter- disciplinary team approach. Early US legislation strongly advocated such an approach:

Environmental impact statements shall be prepared using an interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environ- mental design arts. The disciplines of the preparers shall be appropriate to the scope and issues identified in the scoping approach. (CF.Q 1978, par. I 502.6)

of five people: a project manager, two senior authors, an editorial consultant and a word pro- cessor. This team managed the inputs into the EIA process, co-ordinated over 60 scientific and non-scientific contributors, and organized various public participation and liaison programmes.

The team project manager has a pivotal role. In addition to personnel and team management skills, the manager should have a broad appreciation of the project type under consideration, knowledge of the relevant processes and impacts subject to EIA, the ability to identify important issues and preferably a substantial area of expertise. The project manager must:

Such an interdisciplinary approach not only •
reflects the normal scope of EIA studies, from the
biophysical to the socio-economic, but also brings
to the process the advantages of multiple view- •
points and perspectives on the complex issues
involved.

l'he team producing the EIS may be one, or a
combination, of proponent in-house, lead external consultant, external sub-consultants and indi-
• vidual specialists. The team size can range from
just a few people to more than a dozen mem- bers for larger projects. The team's skills should be complementary: technically for the skills needed to complete the task, and personally for those in the core management team. A small team of three, for instance, could cover the areas of physical/ chemical, biological/ecological and cultural/socio- economic, with a membership that might include, for example, an environmental engineer, an ecol-

select an appropriate project team, and deal with typical personnel issues including staff tum-over;

manage specialist inputs;
liaise with the project proponent, various stakeholders and the public, including choosing the participation techniques to use, and subsequent follow-through;
keep the EIA team on schedule, make sure that the EIA is carried out efficiently, and adapt the team's work to unanticipated events;
ensure that the EIA process focuses on key issues, and is fit for purpose, internally coherent and robust; and
co-ordinate the contributions of the team in the various documentary outputs. (!EMA 2011; Lawrence 2003; Morrison-Saunders and Bailey 2009; Petts & Eduljee 1994)
ogist and a planner, at least one member having training or experience in EIA and management. Additional input could be required from experts in ecology, archaeology, air quality, traffic and other specialist fields. However, the finalization of a team's membership may be possible only after an initial scoping exercise has been undertaken.
Many EIA teams make a clear distinction between a 'core/focal' management team and associated specialists, often reflecting the fact that no one organization can cover all the inputs needed in the production of an EIS for a major project. Some commentators (see Weaver et al. 1996) promote the virtues of this approach. On a study for a major open-cast mining project in South Africa, Weaver et al. had a core project team
E!As can involve many participants with very different perspectives on the relative merits and impacts of projects. In interdisciplinary team work, co-ordination is particularly important: findings and data should be co-ordinated (e.g. they should work to agreed map scales, spatial and temporal boundaries, mitigation measures, and EIS chapter formats) and should be fed into a central source. This is one of the weakest aspects of most assessment teams; all consultants must be aware, and stay aware, of others' work, in order to avoid lacunae, anomalies and contradictions that will be the delight of opposing counsel and the media (Fortlage 1990).
Beyond this, different projects - and their EIAs -

will require different scientific techniques, methods of participation, focuses and ways of responding to unanticipated events. A large, controversial project proposed near a population centre will require a different style of EIA process than a less controversial project, or one in an uninhabited area. An EIA carried out where much detailed data already exist will be different from one in a remote and unstudied location. An EIA for a project that affects groups of people that have traditionally been deprived, or environmental components already subject to cumulative impacts, will be different from one for a homogeneous, wealthy population or a robust environment.

Lawrence (2003) suggests that:

- A rigorous EIA process is more appropriate where scientific analysis can contribute significantly to decision-making: for instance, where the environment can be scientifically analysed, and where the resources for such an analysis exist.

- A rational EIA process is appropriate for situations where stakeholders can engage in the process in a free and 'reasonable' manner, where views are not overly polarised, and where well-defined options and proposals can be put forward.

A streamlined EIA process is appropriate in a polarised situation where resources are limited, relatively little data exists, and changes are likely to take the form of incremental adjustments to the status quo.

- A democratic EIA process works best when proponents are willing to delegate their decision- making authority to representatives, who in turn have the time, energy and resources to participate in planning and decision-making processes with other parties.

- A collaborative EIA process is like a democratic process, but with stakeholders being directly engaged in the process, and having the resources to do so.

- An ethical EIA process is required when issues

of fairness, equity and justice predominate, and when the stakeholders are willing to identify and reconcile these ethical conflicts.

- An adaptive EIA process is appropriate for 4.2.3

EIA costs and resources

4.3

Project screening: is an EIA needed?

turbulent and complex situations where risk, uncertainty and health predominate, and where the EIA needs to take into account knowledge limits and uncertainty-related concerns.

The EIA team and the style of the EIA process will affect, and be affected by, resources. Most of the cost of EIA is incurred in carrying out environmental studies and writing the EIS, and is borne by the developer. However, the planning authority, statutory consultees and the public will also incur costs in reviewing the EIA and com- menting on it.

European Commission research showed that, for countries with several years of EIA experience, the costs of carrying out EIAs tend to range from 0.1 per cent to 1 per cent of the capital cost of the project. Although the actual cost of an EIA tended to rise with the capital cost of the project, it fell as a percentage of the total cost of the project. For smaller projects, EIA costs were typically closer to I per cent of the project cost, whereas for larger projects they were typically closer to 0.1 per cent (EC 2006; COWi 2009; Oosterhuis 2007). This is broadly consistent with EIA costs in the UK, which are discussed at Chapter 8. The World Bank (1999) Enviro11111e11tal assessment so11rcebook also states that EIA costs typically range from a few thousand to over a million dollars, and that they rarely exceed 1 per cent of the total capital cost of the project.

A French study (BIO 2006) suggested that EIAs are generally more expensive for linear projects such as roads and electricity lines, nuclear and industrial activities, projects where health impact assessments are required, projects related to the marine environment, and large companies or administrations. The World Bank (1999) notes that EIA costs can be reduced if local personnel arc used to do most of the work.

The sources above suggest that a typical EIA will take 6-18 months to carry out. However, the time required for the full EIA process can be significantly extended, for instance if the developer proposes modifications to the project, or if there are changes in government. Good scoping can reduce the time needed for EIA by ensuring that the EIA process focuses on key issues and is carried out efficiently. In contrast, a main cause of delay is where the EIA does not provide adequate or relevant data, leading to the need for supple- mentary information (EC 2006).

The number of projects that could be subject to EIA is potentially very large. Yet many projects have no substantial or significant environmental impact. The screening stage seeks to focus on those projects with potentially significant adverse environmental impacts or whose impacts are not fully known. Those with few or no impacts are 'screened out' and allowed to proceed to the normal planning permission and administrative processes without any additional assessment or additional loss of time and expense.

Screening can be partly determined by the EIA regulations operating in a country at the time of an assessment. Chapter 3 indicated that in the EC, including the UK, there are some projects (Annex/Schedule 1) that will always be 'screened in' for full assessment, by virtue of their scale and potential environmental impacts (for example a crude oil refinery, a sizeable thermal power station, a special road). There are many other projects (Annex/Schedule 2) for which the screening decision is less clear. Here two examples of a particular project may be screened in different ways (one 'in' for full assessment, one 'out') by virtue of the project scale, the sensitivity of the proposed location and/or the expectation of adverse environmental impacts. In such cases it is important to have guidelines, indicative criteria or thresholds on conditions considered likely to give rise to significant environmental impacts (see Section 3.4).

In California, a draft environmental impact report is required 'if there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment'. A full environmental impact report is required where there is substantial evi- dence, in light of the whole record, that the project would cause significant impacts on environmental quality, habitats and species, or historical artefacts; negatively affect long-term environmental goals; have 'cumulatively considerable' effects; or would cause substantial adverse effects on human beings (State of California 2010). These constitute 'inclu- sion list' approaches. In addition, there may be an 'exclusion list', as used in California and Canada, which identifies those categories of project for which an EIA is not required because experience has shown that their adverse effects are not significant.

Some ElA procedures require an initial outline Eli\ study to check on likely environmental im- pacts and their significance. Under the California Environmental Quality Act a 'negative declaration' can be produced by the project proponent, claiming that the project has minimal significant effects and does not require a full EIA. The declaration must be substantiated by an initial study, which is usually a simple checklist against which environmental impacts must be ticked as yes, maybe or no. If the responses are primarily 110, and most of the yes and maybe responses can be mitigated, then the project may be screened out from a full EIA.

In general there are two main approaches to screening. The use of thresholds involves placing projects in categories and setting thresholds for each project type. These may relate, for example, to project characteristics (e.g. 20 hectares and over), anticipated project impacts (e.g. 50,000 tonnes or more of waste per annum to be taken from a site) or project location (e.g. a designated landscape area). Appendix 2 shows the applicable thresholds used in the UK. A case-by-case approach involves the appraisal of the characteristics of projects, as they are submitted for screening, against a checklist of guidelines and criteria. Some of the advantages and disadvantages of these two approaches are summarized in Table 4.1. The EC (2001a) has published guidance to help in such case-by-case screening processes. There are also many hybrid approaches with, for example, indicative thresholds used in combination with a flexible case-by-case approach.

The DCLG (2011) EIA guidance gives detailed guidance on how screening should be carried out for English development projects, with extensive reference to case law (see Sections 3.4 and 8.6).

Neither the threshold nor the case-by-case approach gives wholly consistent results, and the

ttTable 4.1 Thresholds versus case-by-case approach to screening: advantages and disadvantages

Advantages Disadvantages

Thresholds Simple to use

Quick to use; more certainty Consistent between locations

Consistent between decisions within locations Consistent between project types

Case by case

Allows common sense and good judgement Flexible - can incorporate variety in project and environment

Place arbitrary, inflexible rules on a variable environment (unless tiered) Less room for common sense or good judgement

May be or become inconsistent, depending on neighbouring receivers and developments Difficult to set and, once set, difficult to change

Lead to a proliferation of proJects lying just below the thresholds

Likely to be complex and ambiguous Likely to be slow and costly

Open to abuse by decision-makers because of political or financial interests Open to poor judgement of decision-makers

Likely to be swayed by precedent and therefore lose flexibility

Table 4.2 Number of EIAs carried out in European Union Member States, 2006-08

Member

Average

Member	Average	Average			
Austria	23	3	Latvia	11	5
Belgium	183	17	Lithuania	142	42
Bulgaria	249	33	Luxembourg	70	149
Cyprus	117	136	Malta	10	24
Czech Rep.	96	9	Netherlands	123	7
Denmark	125	22	Poland	4,000	105
Estonia	80	61	Portugal	323	29
Finland	38	7	Romania	596	27
France	3,867	59			

			Slovak Rep.	670	124
Germany	1,000	12	Slovenia	108	54
Greece	425	38	Spain	1,054	23
Hungary	152	15	Sweden	288	31
Ireland	197	44	United Kingdom	334	5
Italy	1,548	26			

Source: Adapted from GHK 2010

thresholds used by different countries can vary widely. Table 4.2 takes another view of EIAs carried out in European Union Member States (here for the period 2006-08). It shows that the number of EIAs prepared per head of population varies by a factor of 50+ between countries with a consistent legislative basis, namely the EIA Directive; this further reinforces the earlier (Chapter 2) theme of divergent practice in a converging system. These differences can be attributed to factors such as different consenting regimes, levels of develop- ment, environmental sensitivity and cultural values. As such, lower (or indeed higher) levels of EIA activity do not necessarily indicate a problem (IEMA 2011).

A series of European Court of Justice rulings have provided further guidance on how EIA screening should be carried out (EU 2010). They have clarified that, whatever method is used by a Member State to determine whether a project requires EIA or not, the method must not under- mine the objective of the EIA Directive, which is that no project likely to have significant environ- mental effects should be exempt from assessment. In particular:

- The EIA Directive should be interpreted as having a 'wide scope and broad purpose' with respect to screening. A project should not be screened out simply because that type of project is not directly referred to in the EIA Directive or implementing regulations (Kraaijeveld ('Dutch Dykes') case C-72/95).
- Even small-scale projects can have significant effects on the environment if they arc in a

sensitive location (C-392/96).

- EIA is required for refurbishment, improve- ment and demolition projects that are likely to have significant effects on the environment (C-142/07, C-2/07, C-50/09).

The purpose of the EIA Directive cannot be circumvented by splitting larger projects that would require EIA into smaller projects that would not. Similarly, EIAs must consider the cumulative effects of several projects where, individually, these might not have significant environmental effects (C-392/96, C-142/07, C-205/08).

- Although the EIA Directive allows Member States to exempt 'exceptional case' projects

from EIA, the interpretation of 'exceptional cases' should be narrow. Possible rules for qualifying as an 'exceptional case' are that there is an urgent and substantial need for the project; inability to undertake the project earlier; and/or inability to meet the full requirements of the EIA Directive (C-435/97, C-287/98).

- Although a decision to screen a project out of EIA does not require a formal statement 4.4 Scoping: which impacts and issues to consider?

explaining the reasons for doing so, planning authorities have a duty to provide further information on the reasons for the decision if an interested person subsequently requests (C87/02, C121/03, C-75/08).

UK court cases regarding screening are discussed at Section 8.6.

l'he scope of an ElA is the impacts, issues and alternatives it addresses. The process of scoping is that of deciding, from all of a project's possible impacts and from all the alternatives that could be addressed, which are the significant ones. Effective scoping can help to save time and money, shorten the length of EISs, and reduce the need for developers to provide further environmental information after a planning application has been submitted (IEMA 2011).

An initial scoping of possible impacts may identify those impacts thought to be potentially significant, those thought to be not significant and those whose significance is unclear. further study should examine impacts in the various categories in more depth. Those confirmed by such a study to be not significant are eliminated; those in the uncertain category are added to the initial category of other potentially significant impacts. This refining of focus onto the most significant impacts continues throughout the EIA process.

Scoping is generally carried out in discussions between the developer, the LPA, other relevant agencies and, ideally, the public. It is often the first stage of negotiations and consultation between a developer and other interested parties. It is an important step in EIA because it enables the limited resources of the EIA team to be allocated to best effect, and prevents misunderstanding between the parties concerned about the information required in an EIS. Scoping can also identify issues that should later be monitored.

Scoping should begin with the identification of individuals, communities, local authorities and statutory consultees likely to be affected by the project; good practice would be to bring them together in a working group and/or meetings with the developer. One or more of the impact identification techniques discussed in Section 4.8 can be used to structure a discussion and suggest important issues to consider. Other issues could include:

- environmental attributes that are particularly valued;

- impacts considered to be of particular concern to the affected parties;

- the methodology that should be used to predict and evaluate different impacts;
- the scale at which those impacts should be considered; 1 and
- broad alternatives that might be considered.

4.5 The consideration of alternatives 4.5.1 Regulatory requirements

The result of this process of information collection and negotiation should be the identification of the chief issues, impacts and alterna- tives, an explanation of why other issues are not considered significant, and, for each key impact, a defined temporal and spatial boundary within which it will be measured.

Box 4.1 shows excerpts from an admirably brief scoping report prepared by a local planning authority in response to a developer's request for such a report. It illustrates how many of the above points are dealt with in practice.

The European Court of Justice has ruled that an EIA should consider the overall effects of a project, not just its direct effects. In the case of Liege Airport (C-2/07), it ruled that the EIA should consider not only the proposed modifications to the airport's infrastructure but also the increased airport activity that these modifications would permit. Similarly, transboundary impacts are within the scope of EIA (C-205/08).

Although scoping is an important step in the EIA process, it is not legally required in the UK. Some developers produce a scoping report as a matter of good practice, and since I 999 LPAs must provide a formal 'scoping opinion' on the information to be included in an EIS when a developer requests one. A study on UK scoping prac- tice showed that developers formally requested scoping opinions from LPAs for half of the EIA projects examined, with less formal scoping discussions occurring in a further 18 per cent of cases.

Socio economic impact: This subjec1 area should include a considera1ion of access and public amenity issues in rela1ion to the loss of land open 1o public access, as well as a considera1ion of the impac1 of the security/safety of the site. 11 should include a considera1ion of 1he impac1 of the development on the grazing righ1s of commoners. Although perhaps outside 1he sta1u1ory scope of the EIA 1he applican1 may like 1o consider whether a basic assessment of the role of Yennadon Quarry in the local employment/product market may support any accompanying planning application.

Archaeology: Existing records do no1 provide a lot of evidence of in terms of archaeological features already identified in this area. As such this section of the EIA should include a walkover survey and a tes1 pi1 to provide an assessment by a qualified archaeologist of the nature of below ground conditions (e.g. presence of peat, depth of subsoil). Any further survey work identified as necessary should then also be undertaken as part of the EIA.

Geology and hydrogeology: The site is identified as being on an Aquifer of lntermedia1e Vulnerability; i1is approximately 450m from the inner waler Source Protec1,on Zone 1 and approxima1ely 200m from the Devonport Leal. The EIA should consider the impac1 of the developmen1 on 1hese features. Further advice from the Environment Agency is available in their publication Scoping guidelines on the EIA of projects (2002) (part D2 - opencast mining and quarrying opera1ions).

Ecological impacts and biodiversity: This Authority would require assessmen1 to comprise a Phase 1 habitat survey, as well as any specialist surveys then identified as necessary. The assessmen1 should include a consideration of avoidance, mi1igation and compensation measures as necessary.

Cumulative impacts and an assessment of alternatives: Further to the above topic areas it is essential that the EIA includes a consideration of cumulative impacts and demonstrates a consideration of alterna1ives. The Authority would advise that the assessment should refer each subject to its potential impac1 upon the special qualities of the National Park and the purposes

of National Park designation.
The adoption of this scoping opinion does not preclude the Mineral Planning Authority from requesting addi1ional information following submission by the applicant, under Regulation 19 of the Town and Country Planning {EIA) (England and Wales) Regulations 1999.
Source: Dartmoor National Park Au1hority 2010

Box 4.1 Extracts from a scoping opinion for extension of a quarry in a National Park

In almost two-thirds of cases, developers provided scoping reports to accompany their requests for a scoping opinion. Most of the scoping opinions were prepared in-house by the LPA, and they consulted with other statutory bodies in nearly three-quarters of cases. Two-thirds of the respon- dents felt that scoping improved the quality of the EIS subsequently submitted, by improving the report's focus, bringing a wider range of concerns to the discussion, and reducing the need to request further information at later stages (DCLG 2006). In contrast, IEMA (2011) suggests that many scoping opinions are overly exigent, do not help to scope out issues, and do not prevent local authorities or statutory consultees from requesting further information after an EIS is prepared.

Other countries (e.g. Canada and The Nether- lands) have a formal scoping stage, in which the developer agrees with the competent authority or an independent EIA commission, sometimes after public consultation, on the subjects the EIA will cover. The EC (2001b) has published a detailed scoping checklist; Carroll and Turpin (2009) pro- vide lists of potential issues associated with a range of development projects; and the Environment Agency (2002) and Government of New South Wales (1996) are examples of organizations that have developed EIA guidance for particular types of projects.

The US Council on Environmental Quality (CEQ 1978) calls the discussion of alternatives 'the heart of the environmental impact statement': how an EIA addresses alternatives will determine its relation to the subsequent decision-making pro- cess. A discussion of alternatives ensures that the developer has considered both other approaches to the project and the means of preventing environmental damage. It encourages analysts to focus on the differences between real choices. It can allow people who were not directly involved in the decision-making process to evaluate various aspects of a proposed project and understand how decisions were arrived at. It also provides a framework for the competent authority's decision, rather than merely a justification for a particular action. Finally, if unforeseen difficulties arise during the construction or operation of a project, a re-examination of these alternatives may help to provide rapid and cost-effective solutions.

The US NEPA requires federal agencies to analyse 'alternatives to the proposed action'. The implementation of this requirement has been the subject of a range of legal challenges, mostly on the basis that federal agencies had not considered a full range of reasonable alternatives, or that they had improperly constructed the purpose and need for their projects so that the resulting alternatives were too narrow. Generally the courts have ruled in favour of the federal agencies, accepting their reasons for eliminating seemingly 'reasonable' alternatives from analysis in the EIA (Smith 2007). The original EC Directive 85/337 stated that alternative proposals should be considered in an EIA if the information was relevant and if the developer could reasonably be required to compile this information. Annex Ill required 'where appropriate, an outline of the main alternatives studied by the developer and an indication of the main reasons for this choice, taking into account the environmental effects'. In the UK, this require- ment was interpreted as being discretionary, and in the 1990s the consideration of alternatives was one of the weakest aspects of EIS quality (Barker and Wood 1999; Eastman 1997; Jones et al. 1991). One of the main changes resulting from the 1997 amendments to the EIA Directive (CEC 1997) was a strengthening of the requirements on alternatives: E!Ss are now required to include 'an outline of the main alternatives studied by the developer and an indication of the main reasons for the developer's choice, taking into account the environmental effects'. Government guidance (DCLG 2011) is that:

Where alternative approaches to develop- ment have been considered, including alternative choices of process or design, or phasing of construction, the ES should include an outline of the main ones, and the main reasons for the choice made. Although the Directive and the Regulations do not expressly require the applicant to study alternatives, and do not define 'alternatives', the nature of certain developments and their location may make the consideration of alternative sites a material consideration ... In such cases, the ES must record this consideration of alternative sites.

During the course of project planning, many decisions are made concerning the type and scale of the project proposed, its location and the processes involved. Most of the possible alterna- tives that arise will be rejected by the developer on economic, technical or regulatory grounds. The role of EIA is to ensure that environmental criteria are also considered at these early stages, and to document the results of this decision-making stage. A thorough consideration of alternatives begins early in the planning process, before the type and scale of development and its location have been agreed on. A number of broad types of alternative can be considered: the 'no action' option, alterna- tive locations, alternative scales of the project, alternative processes or equipment, alternative site layouts, alternative operating conditions and alternative ways of dealing with environmental impacts. We shall discuss the last of these in Section 5.4.

The 'no action' or 'business as usual' option refers to environmental conditions if a project were not to go ahead. In essence, consideration of the 'no action' option is equivalent to a discussion of the need for the project: do the benefits of the project outweigh its costs? This option must be considered in some countries (e.g. the USA), but is rarely discussed in UK E!Ss.2

The consideration of alternative locations is an essential component of the project planning process. In some cases, a project's location is con- strained in varying degrees: for instance, gravel extraction can take place only in areas with suffi- cient gravel deposits, and wind farms require locations with sufficient wind speed. In other cases, the best location can be chosen to maximize, for example, economic, planning or environmental considerations. For industrial projects, for instance, economic criteria such as land values, the avail- ability of infrastructure, the distance from sources and markets, and the labour supply are likely to be important. For road projects, engineering criteria strongly influence the alignment (e.g. Figure 4.1). In all these cases, however, siting the project in 'environmentally robust' areas, or away from designated or environmentally sensitive areas, should be considered.

The consideration of different scales of develop- ment is also integral to project planning. In some cases, a project's scale will be flexible. For instance, the size of a waste disposal site can be changed, depending, for example, on the demand for land- fill space, the availability of other sites and the presence of nearby residences or environmentally sensitive sites. The number of turbines on a wind farm could vary widely. In other cases, the devel- oper will need to decide whether an entire unit should be built or not. For instance, the reactor building of a nuclear power station is a large discrete structure that cannot easily be scaled down. Pipelines or bridges, to be functional, cannot be broken down into smaller sections.

Alternative processes and equipment involve the possibility of achieving the same objective by a different method. For instance, 1500 MW of electricity can be generated by one combined-cycle gas turbine power station, by a tidal barrage, by several waste-burning power stations or by hundreds of wind turbines. Gravel can be directly extracted or recycled, using wet or dry processes. Waste may be recycled, inc:inerated or put in a landfill.

Once the location, scale and processes of a development have been decided upon, different project/site layouts and designs can still have differ- ent impacts. For instance, noisy plants can be sited near or away from residences. Power station cooling towers can be few and tall (using less land) or many and short (causing less visual impact). Buildings can be sited either prominently or to minimize their visual impact. Figure 4.2 shows different bridge designs.

Similarly, operating co11- ditio11s can be changed to minimize impacts. For instance, a level of noise at night is usually more annoying than the same level during the day, so night-time work could be avoided. Establishing designated routes for project-related traffic can help to minimize disturbance to local residents. Construction can take place at times of the year that minimize environmental impacts on, for example, migratory and nesting birds. These kinds of 'alternatives' act like mitigation measures.

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Figure 4.1

Example of locational alternatives: same of 1he routes considered far the Forth Replacement Crossing

Source: Scotbsh Government, Jacobs, and Arup 2009

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FORTH AEPUCEIIENT CROSSING
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Figure 4.2

Example of alternative designs: designs considered for the Forth Replacement Crossing
Source: Scottish Government, Jacobs, and Arup 2009

As can be seen from Figures 4.1 and 4.2, alterna- tives can be tiered, with decisions made at an earlier stage (or higher tier) acting as the basis for • the consideration of lower-tier decisions. In the case of the Forth Bridge Replacement, the bridge route was chosen first, and then various bridge designs for that route were considered. Another example of tiering is the choice of a location for • a new wind farm, then the choice of the preferred turbine design, and then the detailed siting of individual turbines.

Alternatives must be reasonable: they should
of how they selected the range of alternatives that is studied in detail in the EIA;
if someone proposes an alternative that they feel is 'reasonable', the project proponent should

carefully consider this, and the EIA should provide a well-reasoned explanation for why it is dismissed;
where a proposed action is unlikely to have significant impacts, then developing addi- tional alternatives to the 'do minimum' alternative does not make sense.
not include ideas that are not technically possible, or illegal. The type of alternatives that can realistically be considered by a given developer will also vary. A mineral extraction company that has put a deposit on a parcel of land in the hope of extracting sand and gravel from it will not consider the option of using it for wind power generation: 'reasonable' in such a case would be other sites for sand and gravel extraction, or other scales or processes. Essentially, alternatives should allow the competent authority to understand why this project, and not some other, is being proposed in this location and not some other.
On the other hand, from a US context (where ElSs are prepared by government agencies) Steinemann (2001) argues that alternatives that do not meet a narrow definition of project objectives tend to be too easily rejected, and that alternatives should reflect social, not just agency, goals. She also suggests that
the current sequence - propose action, define purpose and need, develop alternatives, then analyze alternatives - needs to be revised. Otherwise the proposed action can bias the set of alternatives for the analysis. Agencies should explore more environmentally sound approaches before proposing an action. Then, agencies should construct a purpose and need statement that would not summarily exclude less damaging alternatives, nor unduly favour the proposed action. Agencies should also be careful not to adhere to a single 'problem' and 'solution' early on.

Smith (2007) concludes, in a US context, that:

- project proponents should explain the reasons for the choices they make, particularly in terms

4.5.3

The presentation and comparison of alternatives

These very reasonable rules of thumb also make sense in other contexts.

The impacts and costs of alternatives vary for different groups of people and for different environmental components. Discussions with local residents, statutory consultees and special interest groups may rapidly eliminate some alternatives from consideration and suggest others. However, it is unlikely that one alternative will emerge as being most acceptable to all the parties concerned. The EIS should distil information about a reason- able number of realistic alternatives into a format that will facilitate public discussion and, finally, decision-making. Methods for comparing and presenting alternatives span the range from simple, non-quantitative descriptions to quite detailed, quantitative modelling.
Many of the impact identification methods discussed later in this chapter can also help to compare alternatives. Overlay maps compare the impacts of various locations in a non-quantitative manner. Checklists or less complex matrices can be applied to various alternatives and compared; this may be the most effective way to present the impacts of alternatives visually. Weighted or multi- criteria matrices assign quantitative importance weightings to environmental components, rating each alternative (quantitatively) according to its impact on each environmental component, multi- plying the ratings by their weightings to obtain a weighted impact, and aggregating these weighted impacts to obtain a total score for each alternative. These scores can be compared with each other to identify preferable alternatives.

At first glance, the description of a proposed development would appear to be one of the more straightforward steps in the EIA process. However, projec:ts have many dimensions, and relevant information may be limited. As a consequence, this early step may pose challenges. Crucial dimensions to be clarified include the purpose of the project, its life cycle, physical presence, process(es), policy context and associated policies.
!'he 2011 EIA Regulations require an environ- mental statement to include

- a description of the development, including in particular a desc:ription of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;

a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; and

- an estimate, by type and quantity, of expected

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residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.

Such information must be given where it 'is reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current know- ledge and methods of assessment, reasonably be required to compile' (DCLG 201 !).

An outline of the purpose and ratio11ale of a project provides a useful introduction to the project description. This may, for example, set the project in a wider context - the missing section of road, a power station in a programme of developments, a new housing project in an area of regeneration or major population growth. A discussion of purpose may include the rationale for the particular type of project, for the choice of the project's location and for the timing of the development.

It may also provide background information on planning and design activities to date.

Understanding

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Figure 4.3

Three extraction phases for a sand and gravel quarry
Source: Pattersons Ouarnes/SLR 2009

Understanding a project also involves an understanding of the processes integral to it. The nature of processes varies between industrial, service and infrastructure projects, but many can be described as a t1ow of inputs through a process and their transformation into outputs. Where relevant, a process diagram for the different activi- ties associated with a project should accompany the location and site-layout maps. This could identify the nature, origins and destinations of the inputs and outputs, and the timescale over which they are expected. This may be presented in the form of a simplified pictorial diagram or in a block flow chart. Figure 4.4 shows an example of a materials llow chart for a waste management facility comprising waste sorting and energy from waste production; it outlines the types of inputs and outputs, their expected quantities, and where the outputs will end up. A comprehensive flow chart of a production process should include the types, quantities and locations of resource inputs, intermediate and final product outputs, and wastes generated by the total process.

Physical characteristics of the project may include:

- the land take and physical transformation of a site (e.g. clearing, grading), which may vary between different stages of a project's life cycle;
- the total operation of the process involved (usually illustrated with a process-flow dia- gram);

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- the types and quantities of resources used (e.g. water abstraction, minerals, energy);
- transport requirements (of inputs and out- puts);
-

the generation of wastes, including estimates of types, quantity and strength of aqueous wastes, gaseous and particulate emissions, solid wastes, noise and vibration, heat and light, radiation, etc.;

- the potential for accidents, hazards and emer- gencies; and
- processes for the containment, treatment and disposal of wastes and for the containment and handling of accidents; monitoring and surveillance systems.

Socio-economic characteristics may include:

- the labour requirements of a project - includ- ing size, duration, sources, particular skills categories and training;
- the provision or otherwise of housing, trans- port, health and other services for the work- force;
- the direct services required from local busi- nesses or other commercial organizations;
- the flow of expenditure from the project into the wider community (from the employees and subcontracting); and
- the flow of social activities (service demands, community participation, community con- flict).

Metals for recycling 1,000 t/yr

for reuse 12,000 t/yr

Commercial and industrial waste
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Metals 6,000 I/yr
Plastics 7,000 t/yr

Paper and cardboard 6,000 I/yr

for recycling

Figure 4.4

To landfill 5,000 tlyr
Inert materials 1,000 t/yr ---+ To landfill

Materials flow chart for a hypo1he1ical waste management facility
Clearly the physical/ecological and socio- economic dimensions of projects interact with each other. Research on ecosystem services (e.g. UKNEA 2011) is clarifying the value to society of ecosystems in the form of products (e.g. food, fibre, fuel) and services (e.g. pollination, carbon fixing). In turn, social interventions such as training or people's travel behaviour can improve or reduce the delivery of ecosystem services.
The projects may also have associated policies,
not obvious from site layouts and process-flow diagrams, but which arc nevertheless significant for subsequent impacts. For example, shift-working will have implications for transport and noise that may be very significant for nearby residents. The use of a construction site hostel, camp or village can significantly internalize impacts on the local housing market and on the local community. The provision of on- or off-site training can greatly affect the mixture of local and non-local labour and the balance of socio-economic effects.
Projects should be seen in their planning policy
context. In the UK, the main local policy context is outlined and detailed in Local Development Frameworks. The description of location must pay regard to land-use designations and development constraints that may be implicit in some of the designations. Of particular importance is a project's location in relation to various environmental designations (e.g. areas of outstanding natural beauty, Special Areas of Conservation and Special Protection Areas, heritage designations such as listed buildings). Attention should also be given to national planning guidance, provided in the UK by Planning Policy Guidance and Statements and National Policy Statements (NPSs).

4. 6. 2 Sources and presentation of data
The initial brief from the developer provides the starting point. Ideally, the developer would have detailed knowledge of the proposed project's characteristics, likely layout and production pro- cesses, and he able to draw on previous experience. An analyst can supplement information with reference to other EISs for similar projects; although these are normally not monitored so the correct- ness of their predictions is untested (see Chapters
7 and 8). The analyst may also draw on EIA literature (books and journals), guidelines, manuals and statistical sources, including NPSs, CEC (1993), Morris and Therivel (2009), Rodriguez-Bachiller with Glasson (2004), and United Nations Univer- sity (2007). Site visits can be made to comparable projects, and advice can be gained from consultants with experience of the type of project under consideration.
As the project design and assessment process develop - in part in response to early EIA findings -
so the developer will have to provide more detailed information on the characteristics specific to the project. The identification of sources of potential significant impacts may lead to changes in layout and process.

Data about the project can be presented in different ways. The life cycle of a project can be illustrated on a linear bar chart. Particular stages may be identified in more detail where the impacts are considered of particular significance; this is often the case for the construction stage of major projects. Location and physical presence are best illustrated on a map base, with varying scales to move from the broad location to the specific site layout. This may be supplemented by aerial photographs, photo-montages and visual mock-ups according to the resources and issues involved.
The various information and illustrations should clearly identify the main variations between a project's stages. Figure 4.5 illustrates a labour- requirements diagram that identifies the widely differing requirements, in absolute numbers and in skill categories, of the construction and opera- tional stages. More sophisticated flow diagrams could indicate the type, frequency (normal, batch, intermittent or emergency) and duration (minutes or hours per day or week) of each operation. Seasonal and material variations, including time periods of peak pollution loads, can also be docu- mented.
Unfortunately, in some cases the situation may be far from ideal, with inadequate information provided by the developer - especially in the case of new types of projects. Site layout diagrams and process-flow charts may be only in outline, provisional form at the initial design stage, and the project may change significantly during the planning stage (Frost 1994). The planning appli- cation may be an outline application only. A series of European Court of Justice rulings has concluded that, where a consent procedure involves a
principal decision and a subsequent implement- ing decision that cannot go beyond the parameters set by the principal decision, then the EIS must assess the project's environmental effects in time to inform for the principal decision. Only those effects that are not identifiable until

the imple- menting decision should be assessed to inform the later decision (C-201/02, C-508/03, C-290/03; and C2/07).
Further information on these cases is provided in COWi (2009). Even where the project's parameters arc well understood early on, and the planning application is a detailed application, there will still need to be considerable interaction between the EIS analyst and the developer to refine the project's characteristics.

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4,000

3,000

2,000

CONSTRUCTION STAFFING

I

Mechanical and electrical operatives

D Staff

Civil operatives

Site services and security

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4.7
 Establishing the environmental baseline •
 'hard' data from reliable sources which can be verified and which are not subject to short-term change, such as geological records and physical surveys of topography and infra-structure;

- Start of main foundations

Industrial staff

OPERATION STAFFING
Managerial and technical staff
D Clerical and

!!_.

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1 1 · --

Figure 4.5
administrative staff
3 4 5 6 7 8 9 10 11 12
Year from start of main foundations

Labour requirements (in numbers of workers) for a project during construction and operation

4. 7. 1 General considerations
The establishment of an environmental baseline includes both the present and likely future state of the environment, assuming that a proposed project is not undertaken, taking into account changes resulting from natural events and from other human activities. For example, the population of a species of fish in a lake may already be declining before the proposed introduction of an industrial project on the lake shore. Figure 1.7 illustrated the various time, component and scale dimensions of the environment, and all these dimensions need to be considered in the establish- ment of the environmental baseline. The period for the prediction of the future state of the environ- ment should be comparable with the life of the proposed development; this may mean predicting for several decades. Components include both the biophysical and socio-economic environment. Spatial coverage may focus on the local, but refer to the wider region and beyond for some environ- mental elements.
Initial baseline studies may cover a wide range
normally consider the various environmental ele- ments separately, it is also important to understand the interaction between them and the functional relationships involved; for instance, flora will be affected by air and water quality, and fauna will be affected by flora. This will facilitate prediction. As with most aspects of the EIA process, establish- ing the baseline is not a 'one-off' activity. Studies will move from broad-brush to more detailed and focused approaches. The identification of new potential impacts may open up new elements of the environment for investigation; the identifi- cation of effective measures for mitigating impacts may curtail certain areas of investigation.

4.7.2 Sources and presentation of data
The quality and reliability of environmental data vary a great deal, and this can influence the use of such data in the assessment of impacts. Fortlage (1990) clarifies this in the following useful classification:
of environmental, social and economic variables, • but comprehensive overviews can be wasteful of resources. The studies should focus as quickly as possible on those aspects of the environment that may be significantly affected by the project, either • directly or indirectly:
While every environmental statement (ES) should provide a full factual description of the development, the emphasis of Schedule
4 is on the ·main' or 'significant' environ- mental effects to which a development is
'intermediate' data which arc reliable but not capable of absolute proof, such as water quality, land values, vegetation condition and traffic counts, which have variable values; 'soft' data which are a matter of opinion or social values, such as opinion surveys, visual enjoyment of landscape and numbers of people using amenities, where the responses depend on human attitudes and the climate of public feeling.
Important UK data sources are the Census
likely to give rise. The ES should not be any longer than is necessary to properly assess those effects. Im pacts that have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered iDCLG 2011).
The rationale for the choice of focus should be explained as part of the documentation of the scoping process. Although the studies would
o(Population, Measuring Progress, Environmental
Acco1111ts, Transport Statistics, public health observ- atories and other national and regional Internet data sources, many of which arc compiled for the local and ward level in Neighbourhood statistics. Local authority monitoring units can also provide very useful data on the physical, social and eco- nomic environment. Additional data is unpublished or 'semi-published' and internal to various organiza- tions. In the UK, consultation bodies (e.g. Natural England, Environment Agency and Marine
Management Organization) must make environ- mental information available to any person who requests it, particularly applicants preparing EISs. However, they do not have to undertake research or obtain information that they do not already have (DCLG 2011). See also Chapter S (Section 5.3), and Appendix 6, for other UK and international data sources.
There are of course many other organizations, at local and other levels, which may be able to provide valuable information. Local history, conservation and naturalist societies may have a wealth of information on, for example, local flora and fauna, rights of way and archaeological sites. National bodies such as the RSPB and the Forestry Commission may have particular knowledge and expertise to offer. Consultation with local amenity groups at an early stage in the EIA process can help not only with data but also with the identification of those key environmental issues for which data should be collected.
Even where every use has been made of data from existing sources, there will invariably be gaps in the required environmental baseline data for the project under consideration. Environmental moni- toring and surveys may be necessary. Surveys and monitoring raise a number of issues; they

are inevitably constrained by budgets and time, and must be selective. However, such selectivity must ensure that the length of time over which monitor- ing and surveys are undertaken is appropriate to the task in hand. For example, for certain environ- mental features (e.g. many types of flora and fauna) a survey period of 12 months or more may be needed to take account of seasonal variations
can also be used for more complex analytical func- tions, for instance map overlays and intersections, buffering around given features, multi-factor map algebra, and visibility analysis derived from terrain modelling (Rodriguez-Bachiller 2000).
The analyst should also be wary of the seductive attraction of quantitative data at the expense of qualitative data; each type has a valuable role in establishing baseline conditions. Finally, it should be remembered that all data sources suffer from some uncertainty, and this needs to be explicitly recognized in the prediction of environmental effects (sec Chapter 5).

Impact identification brings together project char- acteristics and baseline environmental charac- teristics with the aim of ensuring that all potentially significant environmental impacts (adverse or favourable) are identified and taken into account in the EIA process. When choosing among the existing wide range of impact identification methods, the analyst needs to consider more specific aims, some of which conflict:
or migratory patterns. Sampling procedures will • often be used for surveys; the extent and implica- tions of the sampling error involved should be • clearly established.
Management
Organization) must make environ-
mental information available to any person who
requests it, particularly applicants preparing EISs.
However, they do not have to undertake research
or obtain information

that they do not already

have (DCLG 2011). See also Chapter S (Section
The simplest impact identification methods involve the use of lists of impacts to ensure that none has been forgotten. rhe most complex include the use of interactive computer program- mes, networks, or the use of weightings to denote impact significance. This section presents a range of these methods, from the simplest checklists needed for compliance with regulations to more complex approaches that developers, consultants and academics who aim to further 'best practice' may wish to investigate further. The methods are divided into the following categories:

In the UK, simple checklists and consultation with the local planning authority and statutory consultees are the most widely used impact identification methods. This focus on simple approaches may be attributable to the high degree of flexibility and discretion in the UK's implemen- tation of the EIA Directive, a general unwilling- ness to make the EIA process over-complex, or dis- illusionment with some of the early complex approaches. For this reason, although earlier edi- tions of this book covered the more complex
impact identification methods (e.g. Sorensen and Moss 1973), this edition does not.
rhe discussion of the methods here relates primarily to impact identification, but most of the approaches can also be useful in other stages of the EIA process - in impact prediction, evaluation, communication, mitigation and enhancement, presentation, monitoring and auditing. As such, there is considerable interaction between Chapters 4-7, paralleling the interaction in practice between these various stages.

Checklists
Most checklists are based on a list of special bio- physical, social and economic factors which may be affected by a development. The simple checklist can help only to identify impacts and ensure that impacts arc not overlooked. Checklists do not usually include direct cause-effect links to project activities. Nevertheless, they have the advantage of being easy to use. Table 3.7 (DETR 2000) is an example of a simple checklist.
Questionnaire checklists are based on a set of questions to be answered. Some of the questions may concern indirect impacts and possible miti- gation measures. They may also provide a scale for classifying estimated impacts, from highly adverse to highly beneficial. Table 4.3 shows part of the EC's (2001b) questionnaire checklist.

Table 4.3 Parl of a questionnaire checklist

No.
Yes/

Which characteristics of the
I

7 Will the project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters. ground waler. coastal waters or the sea?

7.1 From handling. storage, use or spillage of hazardous or toxic materials?

7.2 From discharge of sewage or other effluents (whether treated or untreated) to water or the land?

7.3 By deposition of pollutants emitted to air, onto the land or into water?

The simplest impact identification methods

involve the use of lists of impacts to ensure that none has been forgotten. rhe most complex

include the use of interactive computer program-

mes, networks, or the use

of weightings to denote impact significance. This section presents a range

of these methods, from the simplest checklists

Matrices

Simple matrices are merely two-dimensional charts showing environmental components on one axis and development actions on the other. They are, essentially, expansions of checklists that acknow- ledge the fact that various components of a development project (e.g. construction, operation, decommissioning, buildings, and access road) have different impacts. The action likely to have an impact on an environmental component is identified by placing a tick or cross in the appro- priate cell. Table 4.4 shows an example of a simple matrix.

Magnitude matrices go beyond the mere identifi- cation of impacts by describing them according to their magnitude, importance and/or time frame (e.g. short, medium or longterm). Table 4.S is an example of a magnitude matrix that represents whether the impact is positive or negative with either a red or green circle (red/green/amber 'traffic light' type colours are often used in EIA), and the magnitude of the impact by the depth of colour.

Distributional impact matrices aim to broadly identify who might lose and who might gain from the potential impacts of a development. This is useful information, which is rarely included in the matrix approach, and indeed is often missing from EISs. Impacts can have varying spatial impacts - varying, for example, between urban and rural areas. Spatial variations may be particularly marked for a linear project, such as a road or rail line. A project can also have different impacts on different groups in society (for example the impacts of a proposed new settlement on old people, retired with their own houses, and young people, perhaps with children, seeking affordable housing and a way into the housing market; see Figure S.8).

Where matrices use numerical values to describe impacts, people may attempt to add these values to produce a composite value for the develop- ment's impacts and compare this with that for other developments; this should not be done unless each of the impacts is broadly as important as the others, otherwise these differences in impact importance will not be reflected in the outcome. Weighted matrices try to deal with this issue by assigning weightings to different impacts - and sometimes to different project components - to reflect their relative importance. The impact of the project (component) on the environmental component is then assessed and multiplied by the appropriate weighting(s), to obtain a total for the project. Weightings could reflect environmental

Table 4.4 Example of a simple matrix

pro·iectca t,on

Construction
Operation

Utilities
Residential and Residential
I
Commercial buildings
Parks and open spaces

commercial
buildings
buildings

Soil and geology

Flora

I

Fauna

Air quality

Water quality

Population density

Employment

Traffic

Housing

Community structure

Table 4.5 Example of a magnitude matrix

Projeci aciion

components that are close to legal standards or thresholds; project components that will have long-term and irreversible impacts (Odum et al. 1975); or future long-term impacts that could be given more weight than short-term impacts (Stover 1972).

Table 4.6 shows a small weighted matrix that compares three alternative project sites. Each environmental component is assigned an impor- tance weighting (a), relative to other environ- mental components: in the example, air quality is weighted 21 per cent of the total environmental components. The magnitude (c) of the impact of each project on each environmental component is then assessed on a scale 0-10, and multiplied by (a) to obtain a weighted impact (a x c): for instance, site A has an impact of 3 out of 10 on air quality, which is multiplied by 21 to give the weighted impact, 63. For each site, the weighted impacts can then be added up to give a project total. The site with the lowest total, in this case site B, is the least environmentally harmful.

The attraction of weighted matrices (or, more generally, multi-criteria analysis) lies in their ability to 'substantiate' numerically that a particular course of action is better than others. This may save decision-makers considerable work, and it ensures consistency in assessment and results. However, these approaches, and the 'answers' they lead to, depend heavily on the weightings and impact scales. They effectively take decisions away from decision-makers; they are difficult for lay people to understand; and their acceptability depends on the assumptions (especially the weighting schemes, built into them). People carrying out assessments may manipulate - or be perceived to manipulate - results by changing assumptions. The main problems implicit in such weighting approaches are considered further in Chapter 5.

More generally, checklists and matrices treat the environment as if it consisted of discrete units: impacts are related only to particular parameters, and the complex relationship between environ- mental components is not described. Much infor- mation is lost when impacts are reduced to symbols or numbers. Checklists and matrices do not specify the probability of an impact occurring, their scoring systems are inherently subjective and open

Table 4.6 A weighted matrix: alternative project sites

Environmental component		Alternative					
		Site A		Site B		Site C	
	(a)	(c}	(ax c}	(c)	(ax c)	(c)	(ax c)
Air quality	21	3	63	5	105	3	63
Water quality	42	6	252	2	84	5	210
Noise	9	5	45	7	63	9	81
Ecosystem	28	5	140	4	112	3	84

Total
100

500

364

438

(a) = relative weighling of environmental component (total 100)
(c) = impact of project at particular site on environmental component (0--10)

to bias, and they cannot reveal indirect effects of developments. However, they are (relatively) quick and simple, and they can be used to present scoping findings as well as identifying possible impacts.

Networks or causal chain analyses

Network methods explicitly recognize that environ- mental systems consist of a complex web of relationships, and try to reproduce that web. Impact identification using networks involves following the effects of development through changes in the environmental parameters in the model.

A simple network method is used in the development of many UK Local Transport Plans. Network diagrams are drawn by planners to identify how one action - say, changes to carriageways, junctions or public transport provision (Figure 4.6)
- leads to changes in social, economic and environ- mental conditions. They also identify what precon- ditions are needed to achieve a positive outcome, and problems to avoid. Network methods do not establish the magnitude or significance of inter- relationships between environmental components, or the extent of change. They can require con- siderable knowledge of the environment. Their main advantage is their ability to trace the higher- order impacts of proposed developments.

Overlay (or constraints) maps

Overlay maps have been used in environmental planning since the 1960s (McHarg 1968) before the NEPA was enacted. A series of overlays - originally in the form of transparencies, now more typically in the form of GIS layers - is used to identify, predict, assign relative significance to and communicate impacts. A base map is prepared, showing the general area within which the project may be located. Successive overlay maps are then prepared for the environmental components that arc likely to be affected by the project (e.g. agriculture, woodland, noise). The composite impact of the project is found by superimposing the overlay maps and noting the relative intensity of the total shading. Areas with little or no shading are those where a development project would not have a significant impact. Figure 4.7 shows the principle of overlay maps and Figure 4.8 provides a particularly attractive example.

GIS can be used to assign different importance weightings to the impacts: this enables a sensitivity analysis to be carried out, to sec whether changing assumptions about impact importance would alter the decision.

Overlay maps are easy to use and understand and are popular. They are an excellent way of showing the spatial distribution of impacts. They also lead intrinsically to a low-impact decision. The overlay maps method is particularly useful for identifying optimum corridors for developments such as electricity lines (Figure 4.8) and roads, for comparisons between alternatives, and for assessing large regional developments. However, the method does not consider factors such as the likelihood of an impact, indirect impacts or the difference between reversible and irreversible impacts. It

Key

Physical measure
Route of change

Low-floor buses Bus boarders Bus lanes
Bus priority at junctions and roundabouts

Improved waiting facilities

Improved information

Timing surveys: Average speeds and timetable compliance on main bus routes

ii
Attitude surveys: Public perception of bus services

Patronage surveys: Average loads per journey on main bus routes

Cordon counts:
12 hour counts at 5 locations in the corridor

Air quality: Readings from mobile unit

Accidents: Number of minor and severe accidents in the corridor

Figure 4.6

Causal chain analysis for bus corridor improvements

Source: Adapied from South Yorkshire lniegrated Transport Auihoriiy 2001

Composite Ecological sites Historic sites Visual Settlements Water

Figure 4.7

Overlay map: general principle

requires the clear classification of often indeter- minate boundaries (such as between forest and field), and so may not be a true representation of conditions on the ground. It relies on the user to identify likely impacts before it can be used.

Maps can also be used to show distributional impacts - who wins, who loses, and whether groups that are traditionally disadvantaged will lose out disproportionately. Figure 4.9 shows a US airport development's noise impacts on 'environ- mental justice populations' - areas with a high proportion of low-income or minority populations.

The quality of life assessment (QOLA) (or quality of life capital) approach was developed jointly by the Countryside Agency et al. (2001) as a way of integrating the different agencies' approaches to environmental management. QOLA focuses not on the things but on the benefits that would be affected by a development proposal. It starts with the assumption that things (e.g. woodlands, historical buildings) are important because of the benefits that they provide to people (e.g. visual amenity, recreation, CO_2 fixing), and conversely that management of those things should aim to optimize the benefits that they provide. This emphasis on benefits has subsequently been incorporated in the ecosystem services approach (e.g. DEFRA 2007). Quality of life assessment involves six steps (a-f). Having identified the purpose of the assess- ment (a) and described the proposed development site (b), the benefits/disbenefits that the site offers to sustainability (i.e. to present and future genera- tions) are identified (c). The technique then asks the following questions (d):

sites

Figure 4.8

Overlay map showing constraints associated with siting an electricity transmission line (NB: possible routes for the transmission line are shown in red)

Source: Scottish Power '2009

Figure 4.9

Impact on 'environmental justice' populations: areas exceeding 45 per cent minority and areas exceeding 25 per cent low income

Source: King County lntemabonal Airport 2004

Table 4.7 Comparison of impact identification methods

Criterion

1 Compliance with regulations 7 Compare against carrying capacity

2 Comprehensive coverage (social, economic and physical impacts) 8 Uses qualitative and quantitatwe information

3 Positive vs. negative, reversible vs. irreversible impacts, etc. 9 Easy to use

4 Secondary, indirect, cumulative impacts 10 Unbiased, consistent

5 Significant vs. insignificant impacts 11 Summarizes impacts for use in EIS

6 Compare alternative options

2 3 4 5 6 7 8 9 10 11
Checklists Matrices
•
 simple

•
 magnitude

•
 weighted Network Overlay maps
4.8.3
 Summary

4.9
 Summary

and/or the integration of different experts' analyses of a site.

Table 4.7 summarizes the respective advantages of the main impact identification methods discussed in this section. Impact identification methods need to be chosen with care: they are not politically neutral, and the more sophisticated the method becomes, often the more difficult becomes clear communication and effective participation (see Chapter 6 for more discussion). The simpler methods are generally easier to use, more consis- tent and more effective in presenting information in the EIS, but their coverage of impact significance, indirect impacts or alternatives is either very limited or non-existent. The more complex models incorporate these aspects, but at the cost of immediacy.

The early stages of the EIA process are typified by several interacting steps. These include deciding
whether an EIA is needed at all (screening), consulting with the various parties involved to help focus on the chief impacts (scoping), and an outline of possible alternative approaches to the project, including alternative locations, scales and processes. Scoping and the consideration of alternatives can greatly improve the quality of the process. Early in the process an analyst will also wish to understand the nature of the project concerned, and the environmental baseline conditions in the likely affected area. Projects have several dimensions (e.g. physical presence, processes and policies) over several stages in their life cycles; a consideration of the environmental baseline also involves several dimensions. For both projects and the affected environment, obtaining relevant data may present challenges.
Impact identification includes most of the activities already discussed. It usually involves the use of impact identification methods, ranging from simple checklists and matrices to more complex networks and maps. The methods discussed here have relevance also to the prediction, assessment, communication and mitigation of environmental impacts, which are discussed in the following chapters.

SOME QUESTIONS

The following questions are intended to help the reader focus on the key issues of this chapter.

Assume that a developer is proposing to build a wind farm (or another project of your choice) in an area that you know well, and for which you have been asked to manage the EIS for the project.

- What kind of experts would you want on your team?
- What information about the project would you need to know before you could carry out the EIA scoping stage?
- What types of project alternatives might be relevant? Would there be tiers of alternatives?
- What technique would you use to identify the impacts of the project, and why? 2 Table 4.2 shows that the number of EISs prepared in different European Union Member States varies widely. What issues associated with the screening process might account for these differences?

3 Should all EISs consider the 'no action' alternative? Different locations? Different scales? Different processes? Different designs? Why or why not?

4 What minimum level of information about the project should be presented in the EIS? What additional information could be useful?

5 Of the different figures and tables presented in this chapter, which two or three would you find most helpful when trying to understand a project and its impacts?

6 Section 4.8.1 suggests that quite complex impact identification methods have been devised in the past but not used much in practice. What might be the reason for this?

Notes

This refers both to the spatial extent that will be covered and to the scale at which it is covered. Joao (2002) suggests that the latter - which has been broadly ignored as an issue lo date - could be crucial enough to lead to different decisions depending on the scale chosen.
2 In the US, 'agencies should: consider the option of doing nothing; consider alternatives outside the remit of the agency; and consider achieving only a part of their objectives in order to reduce impact'.

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5
Impact prediction, evaluation, mitigation and enhancement 5.1
Introduction

5.2
Prediction 5.2.1
Dimensions of prediction (what to predict)

•••

The focus of this chapter is the central steps of impact prediction, evaluation, mitigation and enhancement. This is the heart of the EIA process, although, as we have already noted, the process is not linear. Indeed the whole EIA exercise is about prediction. It is needed at the earliest stages, when a project, including its alternatives, is being planned and designed, and it continues through to mitigation and enhancement, monitoring and auditing. Yet, despite the centrality of prediction in EIA, there is a tendency for many studies to underemphasize it at the expense of more descriptive studies. Prediction is often not treated as an explicit stage in the process; clearly defined models are often missing from studies. Even when used, models are not detailed, and there is little discussion of limitations. Section 5.2 examines the dimensions of prediction (what to predict), the methods and models used in prediction (how to predict) and the limitations implicit in such exercises (living with uncertainty). It also includes a brief summary of some useful international and UK forecasting sources.

Evaluation follows from prediction and involves an assessment of the relative significance of the impacts. Methods range from the simple to the complex, from the intuitive to the analytical, from qualitative to quantitative, from formal to informal. CBA, monetary valuation techniques and multi-criteria/multi-attribute methods, with their scoring and weighting systems, provide a number of ways into the evaluation issue. The chapter concludes with a discussion of approaches to the mitigation of significant adverse effects. This may involve measures to avoid, reduce, remedy or com- pensate for the various impacts associated with projects. There is also a discussion of the increas- ingly considered aspect of impact enhancement - that is, where possible, developing the significant beneficial impacts of projects.

The object of prediction is to identify the magnitude and other dimensions of identified change in the environment with a project or action, in comparison with the situation without that project or action. Predictions also provide the basis

for the assessment of significance, which is dis- cussed in Section 5.3.

One starting point to identify the dimensions of prediction in the UK is the lesislative requirements (see Table 3.6, Parts 1 and 2). These basic specifica- tions are amplified in guidance given in E11viro11- me11tal assessment: a guide to the procedures (DETR 2000) as outlined in Table 5.1. As already noted, this listing is limited on the assessment of socio- economic impacts. Table 1.3 provides a broader

Table 5.1 Assessment of effects, as outlined in UK guidance

Assessment of effects (including direct and indirect, secondary, cumulative, short-, medium- and long-term, permanent and tempcrary, and positive and negative effects of project)

Effects on human beings. buildings and man-made features

1 Change in pcpulalion arising from the development, and consequential environmental effects.

2 Visual effects of the development on the surrounding area and landscape.

3 Levels and effects oi emissions from the development during normal operation.

4 Levels and effecis of noise from the development.

5 Effects of the development on local roads and transport.

6 Effects oi the development on buildings, the architectural and historic heritage, archaeological features, and other human artefacts,

e.g. through pollutants, visual intrusion, vibration.

Effects on flora, fauna and geology

7 Loss of, and damage to, habitats and plant and animal species.

8
Loss of, and damage to, geological, palaeotological and physiographic features.

9
Other ecological consequences.

Effects on land

10
Physical effects of the development, e.g. change in local topography, effect of earth-moving on stability, soil erosion, etc.

11
Effects of chemical emissions and deposits on soil of site and surrounding land.

12
Land-use/resource effects: (a)
quality and quantity of agricultural land lo be taken;

(b)
sterilization of mineral resources;

(c)
other alternative uses of the site, including the 'do nothing' option;

(d)
effect on surrounding land uses including agriculture;

(e)
waste dispcsal.

Effects on water

13
Effects of development on drainage pattern in the area.

14
Changes to other hydrographic characteristics, e.g. groundwater level, watercourses, flow of underground water.

15
Effects on coastal or estuarine hydrology.

16
Effects of pollutants, waste, etc. on water quality.

Effects on air and climate

17
Level and concentration of chemical emissions and their environmental effects.

18
Particulate matter.

19
Offensive odours.

20
Any other climatic effects.

Other indirect and secondary effects associated with the project

21 Effects from traffic (road, rail, air, water) related to the development.

22 Effects arising from the extraction and consumption of material, water, energy or other, resources by the development.

23 Effects of other development associated with the project, e.g. new roads, sewers, housing power lines, pipelines, telecommunications, etc.

24 Effects of association of the development with other existing or proposed development.

25 Secondary effects resulting from the interaction of separate direct effects listed above.

Source: DETR 2000

view of the scope of the environment, and of the environmental receptors that may be affected by a project.

Prediction involves the identification of poten- tial change in indicators of such environment receptors. Scoping will have identified the broad categories of impact in relation to the project under consideration. If a particular environmental indi- cator (e.g. SO_2 levels in the air) revealed an increas- ing problem in an area, irrespective of the project or action (e.g. a power station), this should be predicted forwards as the baseline for this particular indicator. ·1 hcsc indicators need to be disaggregated and specified to provide variables that arc measur- able and relevant. For example, an economic impact could be progressively specified as

direct employment ---..
local employment .....
local skilled employment

In this way, a list of significant impact indicators of policy relevance can be developed.

An important distinction is often made between the prediction of the likely magnitllde (i.e. size) and the significance (i.e. the importance for decision- making) of the impacts. Magnitude does not always equate with significance. For example, a large increase in one pollutant may still result in an outcome within generally accepted standards in a 'robust environment', whereas a small increase in another may take it above the applicable standards in a 'sensitive environment' (Figure 5.1). This also highlights the distinction between objective and subjective approaches. The prediction of the magnitude of an impact should be an objective exercise, although it is not always easy. The determination of significance is often a more subjective exercise, as it normally involves value judgements.

As Table 1.4 showed, prediction should also identify direct and indirect impacts (simple cause-effect diagrams can be useful here), the geographical extent of impacts (e.g. local, regional, national}, whether the impacts are beneficial or adverse, and the dllration of the impacts. In addition to prediction over the life of a project (including, for example, its construction, operational and other stages), the analyst should also be alert to the rate of change of impacts. A slow build-up in an impact

Receptor
Sensitivity/Value/Importance

High Medium Low Negligible

Figure 5.1

Example of generic significance matrix (e.g. 'impact magnitude' vs. 'environmental sensitivity')
Source: IEMA 2011

may be more acceptable than a rapid change; the development of tourism projects in formerly remote or undeveloped areas provides an example of the damaging impacts of rapid change. Projects may be characterized by non-linear processes, by delays between cause and effect, and the inter- mittent nature of some impacts should be anti- cipated. The reversibility or otherwise of impacts, their permanency, and their rnm11/ative and synergistic impacts should also be predicted. Cumulative (or additive) impacts are the collective effects of impacts that may be individually minor but in combination, often over time, can be major. Such cumulative impacts arc difficult to predict, and are often poorly covered or are missing alto- gether from EIA studies (see Chapter 12).
Another dimension is the unit of measurement, and the distinction between q11a11titative and qualitative impacts. Some indicators are more readily quantifiable than others (e.g. a change in the quality of drinking water, in comparison, for example, with changes in community stress associated with a project). Where possible, predic- tions should present impacts in explicit units, which can provide a basis for evaluation and trade- off. Quantification can allow predicted impacts to be assessed against various local, national and international standards. Predictions should also include estimates of the probability that an impact will occur, which raises the important issue of uncertainty.

{how to predict)
There are many possible methods to predict impacts; a study undertaken by Environmental Resources Ltd for the Dutch government in the early 1980s identified 1SO different prediction methods used in just 140 EIA studies from The Netherlands and North America (VROM 1984). None provides a magic solution to the prediction problem.

All predictions are based on conceptual models of how the universe functions; they range in complexity from those that are totally intuitive to those based on explicit assumptions concerning the nature of envir- onmental processes ... the environment is
never as well behaved as assumed in models, and the assessor is to be discouraged from accepting off-the-shelf formulae. (Munn 1979)

Predictive methods can be classified in many ways; they are not mutually exclusive. In terms of scope, all methods are partial in their coverage of impacts, but some seek to be more holistic than others. Partial methods may be classified according to type of project (e.g. retail impact assessment) and type of impact (e.g. wider economic impacts). Some may be extrapolative, others may be more 11on11ative. For extrapolative methods, predictions are made that are consistent with past and present data. Extrapolative methods include, for example, trend analysis (extrapolating present trends, modified to take account of changes caused by the project), scenarios (common-sense forecasts of future state based on a variety of assumptions), analogies (transferring experience from elsewhere to the study in hand) and intuitive forecasting (e.g. the use of the Delphi technique to achieve group consensus on the impacts of a project) (Green ct al. 1989; Briedenhann and Butts 2006). Normative approaches work backwards from desired outcomes to assess whether a project, in its environmental context, is adequate to achieve them. For example, a desired socio-economic outcome from the construction stage of a major project may be SO per cent local employment. The achievement of this outcome may necessitate modifications to the project and/or to associated employment policies (e.g. on training). Various scenarios may be tested to determine the one most likely to achieve the desired outcomes. Methods can also be classified according to their form, as the following types of model illustrate.

may

Mathematical models can be spatially aggregated (e.g. a model to predict the survival rate of a cohort population, or an economic multiplier for a par- ticular area), or more locationally based, predict- ing net changes in detailed locations throughout a study area. Of the latter, retail impact models, which predict the distribution of retail expenditure using gravity model principles, provide a simple example; the comprehensive land-use locational models of Harris, Lowry, Cripps and others pro- vide more holistic examples (Bracken, 2008). Mathematical models can also be divided into deterministic and stochastic models. Deterministic models, like the gravity model, depend on fixed relationships. In contrast, a stochastic model is probabilistic, and indicates 'the degree of prob- ability of the occurrence of a certain event by specifying the statistical probability that a certain number of events will take place in a given area and/or time interval' (Loewenstein 1966).

There are many mathematical models available for particular impacts. Reference to various E!Ss (especially from the USA), and to the literature (e.g. Bregman and Mackenthun 1992; Hansen and Jorgensen 1991; Rau and Wooten 1980; Suter 1993; US Environmental Protection Agency 1993; Westman 1985) reveals the availability of a rich array. For instance, Kristensen ct al. (1990) list 21 mathematical models for phosphorus retention in lakes alone. An example of a deterministic mathematical model, often used in socio-economic impact predictions, is the multiplier (Lewis 1988), an example of which is shown in Figure 5.2. The injection of money into an economy - local, regional or national - will increase income in the economy by some multiple of the original injection. Modification of the basic model allows it to be used to predict income and employment impacts for various groups over the stages of the life of a project (Glasson et al. 1988). The more disaggregated (by industry type) input-output member of the multiplier family provides a particularly sophisticated method for predicting economic impacts, but with major data require- ments, and limitations.

Statistical models use statistical techniques such as regression or principal components analysis to describe the relationship between data, to test hypotheses or to extrapolate data. For instance, they can be used in a pollution-monitoring study to describe the concentration of a pollutant as a function of the stream-flow rates and the distance downstream. They can compare conditions at a contaminated site and a control site to determine the significance of any differences in monitoring data. They can extrapolate a model to conditions outside the data range used to derive the model (e.g. from toxicity at high doses of a pollutant to toxicity at low doses) or from data that are available to data that arc unavailable (e.g. from toxicity in rats to toxicity in humans).

Physical/architectural models and experimental methods

Physical, image or architectural models are illustrative or scale models that replicate some element of the project-environment interaction. For example, a scale model (or computer graphics) could be used to predict the impacts of a devclop- men t on the landscape or built environment. Photo-montages can be used to show the views of the project site from the 'receptor' areas, with images of the project superimposed to give an

Figure 5.2

A simple multiplier model for the prediction of local economic impacts

impression of visual impact. The image could be a photograph of a model of the project, or a simple 'wire-line' profile of the project as it will appear to the viewer, showing just its skyline or a more sophisticated 3D impression. More sophisticated representations, where resources permit, can include 'fly-through' computer graphics, showing a proposed project in its proposed setting from a variety of perspectives.

Field and laboratory experimental methods use existing data inventories, often supplemented by special surveys, to predict impacts on receptors. Field tests are carried out in unconfined conditions, usually at approximately the same scale as the predicted impact; an example would be the testing of a pesticide in an outdoor pond. Laboratory tests, such as the testing of a pollutant on seedlings raised in a hydroponic solution, are usually cheaper to run but may not extrapolate well to conditions in natural systems.

Expert judgements and analogue models

All predictive methods in EIA make some use of expert judgement. Such judgement can make use of some of the other predictive methods, such as mathematical models and cause-effect networks or flow charts, discussed below. Expert judge- ment can also draw on analogue models - making predictions based on analogous situations. They include comparing the impacts of a proposed devel- opment with a similar existing development; comparing the environmental conditions at one site with those at similar sites elsewhere; comparing an unknown environmental impact (e.g. of wind turbines on radio reception) with a known environ- mental impact (e.g. of other forms of development on radio reception). Analogue models can be developed from site visits, literature searches or the monitoring of similar projects. The Internet now provides a wealth of information on potential com- parative projects.

Other methods for prediction

The various impact identification methods dis- cussed in Chapter 4 may also be of value in impact prediction. For example, overlays can also be used to predict spatial impacts.

Choice of prediction methods

The nature and choice of prediction methods do vary according to the impacts under consideration, and Rodriguez-Bachiller with Glasson (2004) have identified the following types:

- Hard-modelled impacts: areas of impact prediction where mathematical simulation models play a central role. These include, for example, air and noise impacts. Air pollution impact prediction has been dominated by approaches based on the so-called 'Gaussian dispersion model' which simulates the shape of the pollution plume from the development under concern (Elsom 2009).
- Soft-modelled impacts: areas of impact pre- diction where the use of mathematical simu- lation modelling is virtually non-existent. Examples here include terrestrial ecology and landscape. Terrestrial ecology depends very much on field sample survey for plant and animal species, where the expert's perception of what requires sampling plays an important role (Morris and Thurling 2001). Perception is also important in landscape assessment, but simple photomontages, and the use of GIS, can help in the prediction of impacts (Knight 2009; Wood 2000). Figure 5.3 provides an outline of key steps in landscape assessment.
- Mixed-modelled impacts: areas of impact pre- diction where simulation modelling is com- plemented (and sometimes replaced) by more technically lower-level approaches. Traffic impacts make considerable use of modelling, but often with some sample survey input. Socio-economic impacts may use simple flow diagrams, and mathematical models (as in Figures 5.2 and 5.3) particularly for economic impacts, but they tend to build a great deal on survey methods and expert judgement. This is particularly so with regard to social impacts.

When choosing prediction methods, an assessor should be concerned about their appropriate- ness for the task involved, in the context of the resources available. Will the methods produce what is wanted (e.g. a range of impacts, for the appro- priate geographical area, over various stages), from

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Figure 5.3

Key steps in landscape impact assessment

Source: Rodriguez-Bachiller wrth Glasson 2004

the resources available (including time, data, range of expertise)? In addition, the criteria of replicability (method is free from analyst bias), consistency (method can be applied to different projects to allow predictions to be compared) and adaptability should also be considered in the choice of methods. In many cases, more than one method may be appropriate. For instance, the range of methods available for predicting impacts on air quality is apparent from the 165 closely typed pages on the subject by Rau and Wooten (1980). Table 5.2 provides an overview of some of the methods of predicting the initial emissions of pollutants, which, with atmospheric interaction, may degrade air quality, which may then have adverse effects, for example on humans.

In practice, there has been a tendency to use the less formal predictive methods, and especially expert opinion (VROM 1984). Even where more formal methods have been used, they have tended to be simple, for example the use of photo-montages for visual impacts, or of simple dilution and steady-state dispersion models for water quality. However, simple methods need not be inappropriate, especially for early stages in the EIA process, nor need they be applied uncritically or in a simplistic way. Lee (1987) provides the following illustration:

(a) a single expert may be asked for a brief, qualitative opinion; or

(b) the expert may also be asked to justify that opinion (i) by verbal or mathematical description of the relationships he has taken into account and/or (ii) by indicating the empirical evidence which supports that opinion; or

(c) as in (b), except that opinions are also sought from other experts; or

(d) as in (c), except that the experts are also required to reach a common opinion, with supporting reasons, qualifications, etc.; or

Table 5.2 Examples of me1hods used in predicting air quality impacts

Sources Original pro1ect design da1a on activity and emissions

POLLUTANT EMISSIONS
!
1
Atmospheric interactions
1
DEGRADED AIR QUALITY
1
!
1
EFFECTS ON RECEPTORS
e.g. humans
Published emission data for similar projects Emission factor models
Emission standards
Gaussian dispersion models (interactve programmes)

Wind tunnel models
Water analogue simulation models Expert opinion
Mathematical deposition models Laboratory or field experimental methods Inventories/surveys
•
Dose-response factors

Sources: VROM 1984: Rau and Wooten 1980

(e) as in (d), except that the experts are expected to reach a common opinion using an agreed process of consensus building (e.g. based on 'Delphi' techniques; Golden et al. 1979).

The development of more complex methods can be very time-consuming and expensive, especially since many of these models are limited to specific environmental components and phys- ical processes, and may only be justified when a number of relatively similar projects are proposed. 1 lowever, notwithstanding the emphasis on the simple informal methods, there is scope for math- ematical simulation models in the prediction stage, especially where the assessment requires the handling of large numbers of simple calculations, some processes are time-dependent, and some assessment relationships can only be defined in terms of statistical probabilities.

Causal networks in EIA prediction

An important element in prediction, as noted in some of the previous methods, is the cause and effects relationship. But such relationships are often poorly expressed, if at all, in the EIA process. Yet there would seem to be a good case for the use of causal networks - diagrams that demonstrate causal relationships between their elements - as vehicles that can easily relate and transparently demon- strate cause and effects (Perdicoulis and Glasson 2006, 2009). The special identifiers of causal

networks are a diagrammatic representation of relationships among elements and the attribution of causality to those relationships; the networks are abstract diagrams with nodes and links. Both the network logic and the causality logic of causal networks seem to tie in well with the EIA process. rhey do presuppose that (a) there are links between individual clements of the environment and projects (network logic) and (b) when one element is specifically affected this will have an effect on those elements that interact with it (causality logic) (CEC 1999). A key strength of causal networks is their capability to follow impacts to several levels through sequences of interactions - a fact that also gives them the alternative name of 'sequence

diagrams' (Canter 1996). Two drawbacks are their difficulty in dealing with time and space, and the potential risk for increased complexity (CEC 1999). When they become too complex, they tend to be simplified in ad hoc ways or ignored altogether (Goldvarg and Johnson-Laird 2001).
Two examples of causal networks are illustrated here. The digraph, or directed graph (Figure 5.4), is perhaps the simplest form of causal network. The elements are nodes and directional links (uni-directional arrows), with optional additional information marked directly on those elements. The + and - symbols are used in the sense of accompanying change(+) or reacting to change(-). Cause and effect flow diagrams are directed graphs, but their elements are stated textually in various shapes - mostly rectangles. Causal
Figure 5.4

Example of a digraph, or directed graph
Source: Adapted from Canter
1996

relationships are marked by uni-directional arrows, usually carrying no quantitative information. In general, they are more elaborated graphically, but can be less rich in information than the simple digraphs. Cause and effect flow diagrams are mainly used in EIA for the identification and prediction of impacts related to development projects (CEC 1999; Glasson 2009). Figure 5.5 provides a simple flow diagram for the prediction of the local socio-economic impacts of a power station development. Key determinants in the model are the details of the labour requirements for the project, the conditions in the local econ- omy, and the policies of the relevant local auth- ority and developer on topics such as training, local recruitment and travel allowances. The local recruitment ratio is a crucial factor in the deter- mination of subsequent impacts.

Environmental impact statements often appear more certain in their predictions than they should. This may reflect a concern not to undermine credibility and/or unwillingness to attempt to allow for uncertainty. Yet all predictions have an element of uncertainty, and this should be acknowledged in the EIA process (Beattie 1995; De Jongh 1988). The amended EIA Directive (CEC 1997) and subse- quent UK guidance (DETR 2000) include 'the
probability of the impact' in the characteristics of the potential impact of a project that must be considered. There are many sources of uncertainty relevant to the EIA process as a whole. In their classic works on strategic choice, Friend and Jessop (1977) and Friend and Hickling (1987) identified three broad classes of uncertainty: uncertainties about the physical, social and economic working environment (UE), uncertainties about guiding values (UV) and uncertainties about related deci- sions (UR) (Figure 5.6). All three classes of uncer- tainty may affect the accuracy of predictions, but the focus in an EIA study is usually on uncertainty about the environment. This may include the use of inaccurate and/or partial information on the project and on baseline-environmental conditions, unanticipated changes in the project during one or more of the stages of the life cycle, and over- simplification and errors in the application of methods and models. Socio-economic conditions may be particularly difficult to predict, as under- lying societal values may change quite dramatically over the life, say 30-40 years, of a project.
Uncertainty in EIA predictive exercises can be handled in several ways. The assumptions under- pinning predictions should be clearly stated; issues of probability and confidence in predictions should be addressed, and ranges may be attached to predictions within which the analyst is n per cent confident that the actual outcome will lie.

POWE STATION DEVELOPMENT

I

Figure 5.5

A cause-effect flow diagram for the local socio-economic impacts of a power sta1ion proposal

Source: Glasson et al. 1987

Figure 5.6

The types of uncertainly in decision-making
Source: Friend and Hickling 1987

t
DECISION

PROBLEM,,

For example, scientific research may conclude that the 95 per cent confidence interval for the noise associated with a new industrial project is 65-70 dBA, which means that only 5 times out of 100 would the dBA be expected to be outside this range. Tomlinson (1989) draws attention to the twin issues of probability and confidence involved in predictions. These twin factors are generally expressed through the same word. For example, in the prediction 'a major oil spill would have major ecological consequences', a high degree of both probability and confidence exists. Situations may arise, however, where a low probability event based upon a low level of confidence is predicted. This is potentially more serious than a higher probability event with high confidence, since low levels of confidence may preclude expenditure on mitigating measures, ignoring issues of significance. Monitor- ing measures may be an appropriate response in such situations. It may also be useful to show im- pacts under 'peak' as well as 'average' conditions for a particular stage of a project; this may be very relevant in the construction stage of major projects. Sensitivity analysis may be used to assess the consistency of relationships between variables. If the relationship between input A and output B is such that whatever the changes in A there is little change in B, then no further information may be needed. However, where the effect is much more variable, there may be a need for further information. Of course, the best check on the accuracy of predictions is to check on the outcomes of the implementation of a project after the deci- sion. This is too late for the project under con- sideration, but could be useful for future projects. Conversely, the monitoring of outcomes of similar projects may provide useful information for the project in hand. Holling (1978), who believes that the 'core issue of EIA is how to cope with decision-making under uncertainty', recommends a policy of adaptive EIA, with periodic reviews of the El,\ through a project's life cycle. Such adaptive assess- ment, using a 'predict, monitor and manage' approach is a valuable and sensible response to dealing with the inherent problem of uncertainty in prediction in impact assessment. Another pro- cedural approach would be to require an uncertainty report as one step in the process; such a report would bring together the various sources of uncer- tainty associated with a project and the means by which they might be reduced (uncertainties are rarely eliminated).

Table 5.3 Some forecasting data sources: international and UK

Source (inlerna1ional)	Brief summary of content
United Na1ions Environment Programme (UNEP)	The UNEP Global environment ouMook 3 (GEO) project (2002: past, present and future perspectives) reviews trends over the period 1972 to 2002, and then uses scenarios to explore possible futures to 2030. The scenarios are: market first, policy first, security first, and sustainability first. Key topics covered include land use, popula1ion, biodiversity, climate change and water resources.
Organisa1ion for Economic Cc-operation and Development (OECD)	In Environmental outlook to 2030 {OECD 2008), the organization reviews economic and social developments that will influence environmen1al changes. Key environmental impac1s considered include climate change, biodiversity loss, water scarcity and 1he health impacts of pollution. The research can help In recommending policies to reduce de1rimental environmen1al impacts.
World Business Ccuncil for Sustainable Developmen1 (WBCSD)	In Pathways to 2050: energy and climate change (WBCSD 2005), the Council identifies megatrends in socio-economic variables and uses them to projec1 to 2050, with 2025 as an intermediate checkpoint. Regional trends are examined in the USA and Canada, China, Japan and the EU. Identified megatrends include: power generation, industry and manufacturing, mobility, buildings and consumer choices.
Intergovernmental Panel on Climate Change (IPCC)	The IPCC undertakes scenario analysis for climate change, socio-economics and the environmen1, assessing the interactions between socio-economic parameters and greenhouse gas emissions up to 2100. The IPCC Data Distribution Centre (.DC) holds data on population and human development, economic condi1ions, land use, wa1er, agriculture, energy and biodiversity.
European Environment Agency (EEA)	The European outlook state and outlook 2010 report (EEA 2010) includes a set of assessments of the current slate of Europe's environment, likely future state, eHects of global megatrends, and actions needed 1o reduce detrimental environmental eHec1s. The report primarily focuses on 2020, but scenarios to 2100 are included for climate change and flooding. Another report, EEA research foresight for environment and sustainability (EEA 2007), reviews previous forecasting reports and techniques, including: brainstorming, scenarios, emerging issues analysis, forecasts and modelling. It also identifies some key trends, and associated uncertainties.

Source (UK)	Brief summary of content
Department for Food and Rural Affairs (DEFRA)	
Department of Energy and Climate Change (DECC)	
Department for Business Innovation and Skills (OBIS)	

Natural England (NE)

Environment Agency (EA)
A DEFRA-commissioned Baseline scanning project (Fast Futures 2005) identified trends and emerging issues that could affect the DEFRA work area. Longest term projections were made to 2051 onwards; 1rends were also prioritised. Key categories and sub categories were:

- Social: demographics, values, lifestyles and culture.
- Economic: production, labour and trade.
- Political: governance, policies, laws and regulations.
- Environmental: biosphere, geosphere, atmosphere and hydrosphere.
- Science: basic research, technology and health.

A 2050 pathways analysis (DECC 2010) seeks to illustrate how an 80% reduction in greenhouse gas emissions by 2050 can be achieved. It considers different economic sectors, possible future energy choices and subsequent emissions. It also includes a calculator tool to show impacts of different levels of energy use - with scenarios ranging from' little effort' to 'extremely ambitious'.
OBIS and its predecessors have been undertaking foresight projects, since 2002, 'forecasting' for periods of up lo 80 years into the future. The projects use expert advice to outline a range of possible outcomes, to assist decision makers. Two recent examples of reports include:

- Land use futures, February 2010.
- Powering our lives: sustainable energy management and the built environment, November 2008.

5.2.4
Some current data forecasting sources

5.3
Evaluation 5.3.1
1 Evaluation in the EIA process

The state of the natural environment (NE 2008) highlights existing trends and likely fu1ure changes, primarily in terms of biodiversity and landscapes. Global drivers of change to 2060 {NE 2009) and England's natural environment in 2060 (NE 2009) include the development of four scenarios of how the world might look in 2060. Topics covered in the scenarios are wide ranging, including: grow1h and prosperity, global relations, settlements, population and demographics, social structure and cohesion, governance, resource availability, response to climate change,

mobility and transport, food and farming, employment skills, pace and direction of innovation, environmental values, and leisure and tourism.
The EA website includes an array of environmental information. It also includes information on horizon scanning the future for emerging issues. The EA sees such horizon scanning as different from routine forecasting in that ii is predicated on less certain potential changes and risks. For example, whereas 'traditional' climate change forecasting is based largely upon extrapolation of trends, as modified by certain variable, horizon scanning involves methods of divining and examining less predictable effects.

Published government and agency documents, plus of course the Internet, provide access to a wide range of sources. Some examples of key inter- national and UK sources are briefly noted in Table 5.3.

Once impacts have been predicted, there is a need to assess their relative significance to inform decision-makers whether the impacts may be con- sidered acceptable. Criteria for significance include the magnitude and likelihood of the impact and its spatial and temporal extent, the likely degree of the affected environment's recovery, the value of the affected environment, the level of public concern, and political repercussions. As with pre- diction, the choice of evaluation method should be related to the task in hand and to the resources available. Evaluation should feed into most stages of the EIA process, but the nature of the methods used may vary, for example, according to the num- ber of alternatives under consideration, according to the level of aggregation of information and according to the number and type of stakeholder involved (e.g. 'in-house' and/or 'external' con- sultation).
Evaluation methods can be of various types, including simple or complex, formal or informal, quantitative or qualitative, aggregated or disaggre- gated (sec Maclaren and Whitney 1985; Voogd 1983). Much, if not most, current evaluation of significance in EIA is simple and often pragmatic, drawing on experience and expert opinion rather than on complex and sophisticated analysis. Table 5.4 provides an example of key factors used in Western Australia, where there is a particularly well-developed EIA system (see Chapter 10 also). To the factors in Table 5.4 could also be added scope for reversibility. The factor of public interest or perception ((h) in !"able 5.4) is an important consideration, and past and current perceptions of the significance of particular issues and impacts can raise their profile in the evaluation.
Table 5.4 Determinants of environmental significance

A decision by the (West Australian) EPA {Environmental Protection Authority) as to whether a proposal is likely to have a significant ettect on the environment is made using professional judgement. which is gained through knowledge and experience in the application of EIA. In determining whether a proposal is likely to have a significant ettect on the environment, the EPA may have regard to the following:
(a)
the values, sensitivity and quality of the environment which is likely to be impacted;

(b)
the extent (intensity, duration, magnitude and geographic footprint) of the likely impacts;

(c)
the consequence of the likely impacts (or change);

(d)
resilience of the environment to cope with change;

(e)
the cumulative impact with other projects;

(f)
level of confidence of the impacts predicted;

(g)
objects of the Act, policies, guidelines, procedures and standards against which a proposal can be assessed;

(h)

the public concern;

(,) presence of strategic planning policy framework; or
(J) the extent to which other statutory decision-making processes meet the EPA's objectives and principles for EIA.

Source: West Australian Environmental Protection Authority 2010

The most formal evaluation method is the com- parison of likely impacts against legal requirements a11d standards (e.g. air quality standards, building regulations). Table 5.5 illustrates some of the standards that may be used to evaluate the traffic noise impacts of projects in Britain. Table 5.6 provides an example of more general guidance on standards and on environmental priorities and preferences, from the European Commission, for tourism developments. Of course, for some type of impacts, including socio-economic, there are no clear-cut standards. Socio-economic impacts provide a good example of 'fuzziness' in assess- ment, where the line between being significant or not significant extends over a range of values that build on perceptions as much as facts.

Socio-economic impacts do not have recognized standards. There are no easily applicable 'state of local society' standards against which the predicted impacts of a development can be assessed. While a reduction in local unemployment may be regarded as positive, and an increase in local crime as negative, there are no absolute standards. Views on the significance of economic impacts, such as the proportion and types of local employment on

Table 5.5 Examples of standards in relation to impacts of projects on traffic noise in Britain

- BS 7445 is the standard for description and measurement of environmental noise. It is in three parts: Part 1: Guide to quantities and procedures; Part 2: Guide to acquisition of data; and Part 3: Guide to application of noise limits.
- Noise is measured in decibels (dB) at a given frequency. This is an objective measure of sound pressure, Measurements are made using a calibrated sound meter. Human hearing is approximately in the range 0-140 dBA.

dB	Example of noise
<40	quiet bedroom
60	busy office
7'1	car at 60 km/h at a distance of 7 m
85	Heavy goods vehicle (HGV) at 40 km/h at a distance of 7 m
90	hazardous to hearing from continuous expcsure
105	jet flying overhead at 250 m
120	threshold of pain

- Tratfic noise is perceived as a nuisance even at low dB levels. Noise comes from tyres on the road, engines, exhausts, brakes and HGV bodies. Poor maintenance of roads and vehicles and poor driving also increase road noise. Higher volumes of traffic and higher proportions of HGVs increase the noise levels. In general, annoyance is proportional to traffic flow for noise levels above 55 dB(A). People are sensitive to a change in noise levels of 1 dB (about 25% change in flow).
- Assessment of traffic noise is assessed in terms of impacts within 300 m of the road. The EIA will estimate the number of properties and relevant locations (e.g. footpaths and spcrts fields) in bands of distance from the route: 0-50 m, 50-100 m, 100-200 m,

200-300 m, and then classify each group according to the baseline ambient noise levels (in bands of <50, 50-60, 60- 70, >70 dB(A)) and the increase in noise (1-3, 3-5, 5--10, 10-15 and >15 dB(A)).

-

Fac;ade noise levels are measured at 1. 7 m above ground, 1 m from fac;ade or 10 m from kerb, and are usually predicted using the Department of Transport's Calculation of road traffic noise (CRTN), which measures dB(A) LA10 JSh· This is the noise level exceeded 10% of the time between 6:00 and 24:00, Noise levels at the fac;ade are approximately 2 dB higher than 10 m from the building,

PPG 13 uses dB(A) L11eq ish· This is between 7:00 and 23:00. Most traffic noise meters use dB(A) LA1o, and an approximate conversion is:

LA,,q.16h"' LAI0,18h- 2dB.
0 18 1 18

The DTP recommends an absolute upper limit for noise of 72 dB(A) L q h ("' 70 dB(A) LA o ,J for residential properties. Compensation is payable to properties within 300 m oi a road development for increases greater than 1 dB(A) which result in LAio,18 n above 67.5.
The DTP considers a change of 30% slight, 60% moderate and 90% substantial. PPG 13 considers 5% to be significant.

There are four categories of noise in residential areas:

Oay(16 h)
Night
Not

B 55-63
<42-57 l
Noise control measures are required

C 63-72 LA,,9
57-{l6LAeq
Strong presumption against developer

D >72 L.
>66
Normally refuse the application

For night-time noise, unless the noise is already in category D, a single event occurring regularly (e.g. HGV movements) where

LA.!9 >82dB puts the noise in category C. Source: Bourdillon 1996

a project, are often political and arbitrary. Never- theless it is sometimes possible to identify what might be termed threshold or step changes in the socio-economic profile of an area. For example, it may be possible to identify predicted impacts that threaten to swamp the local labour market, and that may produce a 'boom-bust' scenario. It may also be possible to identify likely high levels of
leakage of anticipated benefits out of a locality, which may be equally unacceptable. It is valuable if the practitioner can identify possible criteria used in the analysis for a range of levels of impacts, which at least provides the basis for informed debate. Table 5.7 provides an example assessing impact magnitude from nuclear power station projects.

Table 5.6 Example of EC guidance on assessing significance of impacts for tourism projects for Asian, Caribbean and Pacific countries
The significance of certain environmental impacts can be assessed by conirasting the predided magnitude of impad against a relevan1 environmental standard or value. For tourism projects in particular, impact significance should also be assessed by taking due regard of those environmental priorities and preferences held by society but for which there are no quantifiable objectives. Particular attention needs to be focused upon the environmental preferences and concerns of those likely to be directly affected by the project.
Environmental Standards

Water quality standards
potable waler supplies (apply country standards; see also Section 1.3.2, WHO (1982) Guidelines for Drinking Wafer Qualify Directives 80/778/EEC and 75/440/EEC)
wastewater discharge (apply country standards for wastewaters and fisheries; see also 76/160/EEC and 78/659/EEC)
National and local planning regulations legislation concerning change in land use
regional/local land-use plans (particularly management plans for protected areas and coastal zones)
National legislation to protect certain areas national parks
forest reserves nature reserves
natural, hisiorical or culiural sites of importance International agreements to protect certain areas
World Heritage Convention
Ramsar Convention on wetlands
Conservation/preservation of species likely to be sold to tourists or harmed by their activities
nat,onal legislation
international conventions
CITES (Convention on International Trade in Endangered Species).

Environmental Priorities and Preferences

Participation of affected people in project planning to determine priorities for environmental protection, including: public health
revered areas, flora and fauna (e.g. cultural/medicinal value, visual landscape) skills training to undertake local environmental mitigation measures
proteclion of potable waler supply
conservation of wetland/tropical forest services and products, e.g. hunted wildlife, fish stocks
issues of sustainable income generation and employment (including significance of gender - see WID manua

- Government policies for environmental protection (including, where appropriate, incorporation of objectives from country environmental studies/environmental action plans, etc,)

Environmental priorities of tourism boards and trade associations representing tour operators
Source: CEC 1993

Socio-economic impacts can raise in particular the distributional dimension to evaluation, 'who wins and who loses' (Glasson 2009; Vanclay 1999). Beyond the use of standards and legal require- ments, all assessments of significance either im- plicitly or explicitly apply weights to the various impacts (i.e. some are assessed as more important than others). This involves interpretation and the application of judgement. Such judgement can be rationalized in various ways and a range of
methods are available, but all involve values and all arc subjective. Parkin (1992) secs judgements as being on a continuum between an analytical mode and an intuitive mode. In practice, many are at the intuitive end of the continuum, but such judgements, made without the benefit of analysis, are likely to be flawed, inconsistent and biased. The 'social effects of resource allocation decisions are too extensive to allow the decision to "emerge" from some opaque procedure free of overt political

Table 5.7 Example of an approach to assessing the local impact magnitude of a major energy project: socio-economic impacts dimension

Type
Local
Negligible
Minor
Moderate
Major

Demographic impacts

Change in local
Population growth
Change in local
Change in local
Change in local
Change in local

population level
(2001 to 2009):
population of less
than± 0.25%
popula1ion of
± 0.25-1%
population of
± 1-2%
population of more
than± 2%

Direct and indirect employment impacts
Change in Employment growth Change of less 1han Change of Change of Change of more employment level (ABI estimates ± 0.25% on ± 0.25-1% on ± 1-2% on baseline than± 2% on
in local economy 2001to 2007): baseline employment baseline employment employment levels baseline employment
levels in the local levels in the local in the local economy levels in local economy economy
economy
Change in Claimant% Change of less than Change of Change of Change of more unemployment level
unemployment ± 2% in claimant ± 2-5% in claimant ± 5-10% in claimant than± 10% in in local
economy rates (June 2010): unemployment unemployment unemployment claimant
level level level unemployment level Accommodation pressures and development
Change in stock
Housing stock
Change of less than
Change of
Change of
Change of more

of local housing
growth (2001 to
± 0.25% on
± 0.25-1% on
± 1-2% on baseline
than± 2% on

2008)
baseline housing
baseline housing
housing stock
baseline housing

stock
stock

stock

5.3.2 Cost-benefit analysis and monetary valuation techniques

Source: Authors, drawing on various consultancy studies

scrutiny' (Parkin 1992). Analytical methods seek to introduce a rational approach to evaluation. Two sets of methods are distinguished: those that assume a common utilitarian ethic with a single evaluation criterion (money), and those based on the measurement of personal utilities, including multiple criteria. The CHA approach, which seeks to express impacts in monetary units, falls into the former category. A variety of methods, including multi-criteria analysis, decision analysis, and goals achievement, fall into the latter category. The very growth of EIA is partly a response to the limitations of CBA and to the problems of the monetary valuation of environmental impacts. Yet, after several decades of limited concern, there is renewed interest in the monetizing of environ- mental costs and benefits (DoE 1991; HM Treasury 2003). The multi-criteria/multi-attribute methods involve scoring and weighting systems that are also not problem-free. The various approaches are now outlined. In practice, there are many hybrid variations between these two main categories, and these are referred to in both categories.

Cost-benefit analysis (CBA) itself lies in a range of project and plan appraisal methods that seek to apply monetary values to costs and benefits (Lichfield et al. 1975). At one extreme are partial approaches, such as financial-appraisal, cost- minimization and cost-effectiveness methods, which consider only a subsection of the relevant population or only a subsection of the full range of consequences of a plan or project. Financial appraisal is limited to a narrow concern, usually of the developer, with the stream of financial costs and returns associated with an investment. Cost effectiveness involves selecting an option that achieves a goal at least cost (for example, devising a least-cost approach to produce coastal bathing waters that meet the CEC Blue Flag criteria). The cost-effectiveness approach is more problematic where there are a number of goals and where some actions achieve certain goals more fully than others (Winpenny 1991).

Cost-benefit 111111/ysis is more co111prehe11sive in scope. It takes a long view of projects (farther as well as nearer future) and a wide view (in the sense of allowing for side effects). It is based in welfare economics and seeks to include all the relevant costs and benefits to evaluate the net social benefit of a project. It was used extensively in the UK in the 1960s and early 1970s for public sector projects, the most famous being the third London Airport (HMSO 1971). The methodology of CBA has several stages: project definition, the identification and enumeration of costs and benefits, the evaluation of costs and benefits, and the discounting and presentation of results. Several of the stages are similar to those in EIA. The basic evaluation principle is to measure in monetary terms where possible - as money is the common measure of value and monetary values are best understood by the community and decision-makers - and then reduce all costs and benefits to the same capital or annual basis. Future annual flows of costs and benefits are usually discounted to a net present value (Table 5.8). A range of interest rates may be used to show the sensitivity of the analysis to changes. If the net social benefit minus cost is positive, then there may be a presumption in favour of a project. However, the final outcome may not always be that clear. The presentation of results should distinguish between tangible and intangible costs and benefits, as relevant, allowing the decision-maker to consider the trade-offs involved in the choice of an option.

Cost-benefit analysis has excited both advocates (e.g. Dasgupta and Pearce 1978; Pearce 1989; Pearce et al. 1989) and opponents (e.g. Bowers 1990). Hanley and Splash (2003) provide an interesting review of CBA and the environment. CBA does have many problems, including identifying, enumerating and monetizing intangibles. Many environmental impacts fall into the intangible category, for example the loss of a rare species, the urbanization of a rural landscape and the saving of a human life. The incompatibility of monetary and non-monetary units makes decision-making

Table 5.8 Cost-benefit analysis: presentation of results - tangibles and intangibles

Category
Alternative 1
Alternative 2

Tangibles

Annual benefits
£81
£b1

£82
£b2

£83
£b3

Total annual benefits
£81 + 82 + 83
£b1 + b2 + b3

Annual costs
£Cl
£cl

£C2
£c2

Total annual costs
£C3
£Cl + C2 +C3
£c3
£c1 + c2 + c3

Net discounted present value (NDPV) of benefits and costs over 'm' years at X%"

£0

£E

Intangibles

Intangibles are likely to include costs and benefits
/1
i1

12
,2

/3
13

/4
i4

Intangibles summation (undiscounted)
/1 + /2 + /3 + /4
11 + i'2 + ,3 + i4

·e.g NPDV (All 1)

D=LI 81 81 .
•--81
. - B2
. . . ., - B2 83 83
(1 + X)' (1 + X)'
-LI

C1 Cl
(1 + >O' (1 + X)'
(1 + X)" (1 +.X)' (1 + X)" (1 + X)' (1 + X)"
,, I---- ..' (1+ X)' '...• (1+ X'J

Cl C2 C) Cl C3 I
(1 + X)" (1 + X)' (1 + X)"
-

problematic (Bateman 1991). Another problem is the choice of discount rate: for example, should a very low rate be used to prevent the rapid erosion of future costs and benefits in the analysis? This choice of rate has profound implications for the evaluation of resources for future generations. There is also the underlying and fundamental problem of the use of the single evaluation criterion of money, and the assumption that £1 is worth the same to any person, whether a tramp or a millionaire, a resident of a rich commuter belt or of a poor and remote rural community. CBA also ignores distribution effects and aggregates costs and benefits to estimate the change in the welfare of society as a whole.

The pla1111i11g balance sheet (PBS) is a variation on the theme of CBA, and it goes beyond CBA in its attempts to identify, enumerate and evaluate the distribution of costs and benefits between the affected parties. It also acknowledges the difficulty of attempts to monetize the more intangible impacts. It was developed by Lichfield et al. (1975) to compare alternative town plans. PBS is basically a set of social accounts structured into sets of 'producers' and 'consumers' engaged in various transactions. The transaction could, for example, be an adverse impact, such as noise from an airport (the producer) on the local community (the consumers), or a beneficial impact, such as the time savings resulting from a new motorway develop- ment (the producer) for users of the motorway (the consumers). for each producer and consumer group, costs and benefits are quantified per transac- tion, in monetary terms or otherwise, and weighted according to the numbers involved. The findings are presented in tabular form, leaving the decision-
maker to consider the trade-offs, but this time with some guidance on the distributional impacts of the options under consideration (Figure 5.7). Subsequently, Lichfield (1996) sought to integrate EIA and PBS further in an approach he called co1111111111ity impact eva/11ation (CIE).

Partly in response to the 'intangibles' problem in CBA, there has also been considerable interest in the development of monetary valuation techniques to improve the economic measurement of the more intangible environmental impacts (Barde and Pearce 1991; DoE 1991; Winpenny 1991, Hanley and Splash 2003). rhe techniques can be broadly classified into direct and indirect, and they are concerned with the measurement of preferences about the environment rather than with the intrinsic values of the environment. The direct approaches seek to measure directly the monetary value of environmental gains - for example, better air quality or an improved scenic view. Indirect approaches measure preferences for a particular effect via the establishment of a 'dose-response'- type relationship. The various techniques found under the direct and indirect categories are summarized in Table 5.9. Such techniques can contribute to the assessment of the total economic value of an action or project, which should not only include user values (preferences people have for using an environmental asset, such as a river for fishing) but also non-user values (where people value an asset but do not use it, although some may wish to do so some day). Of course, such techniques have their problems, for example the potential bias in people's replies in the contingent valuation method (CVM) approach (for a fasci- nating example of this, see Willis and Powe 1998).

£ = benefils and culs that can be moneliied

M = where Ot,ly a ranking ot mone1ary valuu can be es1imated
i • 1nlan9ib1u
Figure 5.7

Example of structure of a planning balance sheet (PBS)
Table 5.9 Summary of environmental monetary valuation techniques

Direct household production function (HPF)

HPF methods seek to determine expenditure on commodities that are substitutes or complements for an environmental characteristic to value changes In that characteristic. Subtypes include the following:
Avertive expenditures: expenditure on various substitutes for environmental change (e.g. noise insulation as an estimate of the value of peace and quiet).
2 Travel cost method: expenditure, in terms of cost and time, incurred in travelling to a particular location (e.g. a recreation site) is taken as an estimate of the value placed on the environmental good at that location (e.g. benefit arising from use of the site).
Direct hedonic price methods (HPM)

HPM methods seek to estimate the implicit price for environmental attributes by examining the real markets in which those attributes are traded. Again, there are two main subtypes:
Hedonic house land prices: these prices are used to value characteristics such as 'clean air' and 'peace and quiet', through cross- sectional data analysis (e.g. on house price sales in different locations).
2 Wage risk premia: the extra payments associated with certain higher risk occupations are used to value changes in morbidity and mortality (and implicitly human life) associated with such occupations.
Direct experimental markets

Survey methods are used to elicit individual values for non-market goods. Experimental markets are created to discover how people would value certain environmental changes. Two kinds of questioning, of a sample of the population, may be used:
Contingent valuation method (CVM): people are asked what they are willing to pay (WTP) for keeping X (e.g. a good view, a historic building) or preventing Y, or what they are willing to accept (WTA) for losing A, or tolerating B.
2 Contingent ranking method (CRM or stated preference): people are asked to rank their preferences for various environmental goods, which may then be valued by linking the preferences to the real price of something traded in the market (e.g. house prices).
Indirect methods

Indirect methods seek to establish preferences through the estimation of relationships between a 'dose' (e.g. reduction in air pollution) and a response (e.g. health improvement). Approaches

include the following:
Indirect market price approach: the dose-response approach seeks to measure the effect (e.g. value of loss of fish stock) resulting from an environmental change (e.g. oil pollution of a fish farm), by using the market value of the output involved. The replacement- cost approach uses the cost of replacing or restoring a damaged asset as a measure of the benefit of restoration (e.g. of an old stone bridge eroded by pollution and wear and tear).

2 Effect on production approach: where a market exists for the goods and services involved, the environmental impact can be represented by the value of the change in output that 1t causes. It is widely used in developing countries, and is a continuation of the dose-response approach.
Sources: Adapted from DoE 1991: Winpenny 1991; Pearce and Markandya 1990: Barde and Pearce 1991; Nijkamp 2004

However, simply through the act of seeking a value for various environmental features, such techniques help to reinforce the understanding that such features are not 'free' goods and should not be treated as such.

Multi-criteria and multi-attribute methods seek to overcome some of the deficiencies of CBA; in particular they seek to allow for a pluralist view of

society, composed of diverse 'stakeholders' with diverse goals and with differing values concerning environmental changes. Most of the methods use - and sometimes misuse - some kind of simple scoring and weighting system; such systems generate considerable debate. Here we discuss some key elements of good practice, and then offer a brief overview of the range of multi-criteria/multi- attribute methods available to the analyst.
Scoring may use quantitative or qualitative scales, according to the availability of information on the impact under consideration. Lee (1987)

Table

provides an example (Table 5.10) of how different levels of impact (in this example noise, whose measurement is in units of LwdH,1) can be scored in different systems. l'hese systems seek to stand- ardize the impact scores for purposes of com- parison. Where quantitative data are not available, ranking of alternatives may use other approaches, for example using letters (A, B, C, etc.) or words (not significant, significant, and very significant). Weighting seeks to identify the relative import- ance of the various impact types for which scores of some sort may be available (for example, the relative importance of a water pollution impact, the impact on a rare flower). Different impacts may be allocated weights (normally numbers) out of a total budget (e.g. lO points to be allocated
between 3 impacts) - but by whom?
Multi-criteria/multi-attribute methods seek to recognize the plurality of views and weights in their methods; the Delphi approach also uses individ- uals' weights, from which group weights are then derived. In many studies, however, the weights are those produced by the technical team. Indeed the various stakeholders may be unwilling to reveal all their personal preferences, for fear of under- mining their negotiating positions. This internal- ization of the weighting exercise does not destroy the use of weights, but it does emphasize the need for clarification of scoring and weighting systems and, in particular, for the identification of the origin of the weightings used in an El/\. Wherever possible, scoring and weighting should be used to reveal the trade-offs in impacts involved in particular projects or in alternatives. For example,

Table 5.1 o A comparison of different scoring systems Method Alternatives Basis of score
A (no action}
B C D

Score (a)
(aw}
Score (b)
(bw}

Ratio
65
62 71 75 Absolute L,0dBAmeasure
Noise

2
5
10
2

Interval
0
-3
+6 + 10 Difference in L10dBAusing
Loss of flora
5
1
5
4
20

alternative A as base
Air pollution
3
2
6
2
6

Ordinal
B
A
C D Ranking according to
Total

21

28

Table 5.11 shows that the main issue is the trade- off between the impact on flora of one scheme and the impact on noise of the other scheme.

Several approaches to the scoring and weight- ing of impacts have already been introduced in the outline of impact identification methods in Chapter 4. The matrix approach can also be use- fully modified to identify the distribution of impacts among geographical areas and/or among various affected parties (Figure 5.8). Weightings can also be built into overlay maps to identify areas with the most development potential according to various combinations of weightings. Some of the limitations of such approaches have already been noted in Chapter 4.

Other methods in the multi-criteria/multi- attribute category include decision analysis, the goals achievement matrix (GAM), multi-attribute utility theory (MAUT) and judgement analysis.

Multi-aiteria decision mwlysis (MCDA) techniques have emerged as a major approach for resolving natural resource management problems (Herath and Prato 2006; DCLG 2009), and are becoming increasingly used in EIA, especially for major projects. MCDA is a tool that is particularly applic- able to cases where a single criterion approach is inappropriate. It allows decision makers to inte- grate the environmental, social and economic values and preferences of stakeholders, while overcoming the difficulties in monetizing the more intangible non-monetary attributes. Typically the approach defines objectives, chooses the criteria to measure the objectives, specifics alternatives, transforms the criterion scales into units, weights

Table 5.11 Weighting, scoring and trade-offs

Impact Weight (w} Scheme A Scheme B

ascending value of L10dB•
Binary 0 0 1 1 0 = less than 70L10dBA 1 = 70L 0dBAor more

Source: Based on Lee 1987
Figure 5.8

Project Action

Group environmental component I
I

I
Construction stage actions
Operational stage actions

A
B
C
D
a
b
C
d

Group 1
I

(e.g. indigenous population " 45 years old) various

- Social
- Physical
- Economic components

Group 2
(e.g. indigenous population
I
I

< 45 years old) various

- Social
- Physical
- Economic components

Simple matrix identification of distribution of impacts

the criteria to reflect relative importance, selects and applies a mathematical algorithm for rank- ing alternatives, and chooses alternatives. The evaluation can use a variety of quantitative/semi- quantitative and qualitative assessment, and survey methods (Figueira et al. 2005). The former applies metrics to the selected criteria, which allows the calculation of outcomes as noted above. The latter, qualitative approach, uses subjective judgements and rating methods; there are no numbers used, and hence no calculations. In summary, both have their strengths. Quantitative/semi-quantitative tools are systematic, repeatable and inputs and outputs can be verified. Qualitative tools are effec- tive at capturing diverse information, particularly intangible information and insights; while they are less repeatable, they provide narratives to explain results.

While MCDA can be quite complex, it can also be presented in very simple summary fashion, which can be very appealing to decision makers
- but such presentations can also oversimplify the issues and trade-offs involved. A familiar approach is the use of a traffic lights colour approach (green - positive; amber - neutral; red - negative), indicating the extent to which the specified alternatives satisfy the various environ- mental, social and economic objectives. Figure 5.9 provides a schematic example of a summary matrix for a qualitative MCDA (with 5 shadings from deep red to deep green), for alternative locations for a major project. Some of the key elements, and
issues, are set out in the figure. The red shadings indicate a more disadvantageous option per- formance against the relevant criterion/objective; the green shadings indicate more advantageous option performance. In this example, project option 3 is the preferred option by virtue of the spread of good overall performance against the QBL criteria.

The GAM was developed as a planning tool by llill (1968) to overcome the perceived weaknesses of the PBS approach. GAM makes the goals and objectives of a project/plan explicit, and the evaluation of alternatives is accomplished by measuring the extent to which they achieve the stated goals. the existence of many diverse goals leads to a system of weights. Since all interested parties are not politically equal, the identified groups should also be weighted. The end result is a matrix of weighted objectives and weighted interests/agencies (Figure 5.10). The use of goals and value weights to evaluate plans in the interests of the community, and not just for economic efficiency, has much to commend it. The approach also provides an opportunity for public partici- pation. Unfortunately, the complexity of the approach has limited its use, and the weights and goals used may often reflect the views of the analyst more than those of the interests and agencies involved.

Finally, brief reference is made to the Delphi method, which provides another way of incorpor- ating the views of various stakeholders into the

/

/

Cr ten,"' P\'oJ i;;c Option (1-4)

E,tvVOttllll!flllll

a

b

C

d

Figure 5.9

Schematic example of a summary matrix for a qualitative MCDA

evaluation process. The method is an established means of collecting expert opinion and of gaining consensus among experts on various issues under consideration. It has the advantage of obtaining expert opinion from the individual, with guaran- teed anonymity, avoiding the potential distortion caused by peer pressure in group situations. Compared with other evaluation methods it can also be quicker and cheaper.

There have been a number of interesting applications of the Delphi method in ElA (Green et al. 1989, 1990; Richey et al. 1985). Green et al. used the approach to assess the environmental impacts of the redevelopment and reorientation of Bradford's famous Salt Mill. The method involved drawing up a Delphi panel; in the Salt Mill case, the initial panel of 40 included experts with a working knowledge of the project (e.g. planners,

Figure 5.10

Goal description: Relative weight:

a

2

3

Incidence

Relative weight

Costs

Benefits

Relative weight

Costs

Benefits

Group a

1

A

D

5

E

1

Group b

3

H

J

4
M
2

Group c
1
L
J
3
M
3

Group d
2
-
J
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5.4
Mitigation and enhancement 5.4.1
1 Types of mitigation measures

Goals achievement matrix (GAM)
Source: Adapted from
Hill 1968

tourism officers), councillors, employees, acade- mics, local residents and traders. This was designed to provide a balanced view of interests and expertise. The Delphi exercise usually has a three- stage approach: (1) a general questionnaire asking panel members to identify important impacts (positive and negative); (2) a first-round question- naire asking panel members to rate the importance of a list of impacts identified from the first stage; and (3) a second-round questionnaire asking panel members to re-evaluate the importance of each impact in the light of the panel's response to the first round. However, the method is not without its limitations. The potential user should be aware that it is difficult to draw up a 'balanced' panel in the first place, and to avoid distorting the assessment by the varying drop-out rates of panel members between stages of the exercise, and by an overzealous structuring of the exercise by the organizers. for other application and critique, see Breidenhann and Butts (2006), and Landeta (2006).

Mitigation is defined in EC Directive 97/11 as
repairing, rehabilitating, or restoring the affected environment; presentation and maintenance actions during the life of the action; and replacing or providing substitute resources or environments. (CEQ 1978)

The guidance on mitigation measures provided by the UK government is set out in Table 5.12. It is not possible to specify here all the types of mitigation measures that could be used. Instead, the following text provides a few examples, relating to biophysical and socio-economic impacts. The reader is also referred to Morris and Therivel (2009) and Rodriguez-Bachiller with Glasson (2004) for useful coverage of mitigation measures for particular impact types. A review of EISs for developments similar to the development under consideration may also suggest useful mitigation measures.
At one extreme, the prediction and evaluation of impacts may reveal an array of impacts with such significant adverse effects that the only effective mitigation measure may be to abandon the proposal altogether. A less draconian (and more normal) situation would be to modify aspects of the development action to avoid various impacts. Examples of methods to avoid impacts include:
'measures envisaged in order to avoid, reduce and, • if possible, remedy significant adverse effects' (CEC 1997). In similar vein, the US CEQ, in its regula- tions implementing the NEPA, defines mitigation
as including: •

not taking certain actions; limiting the proposed action and its implementation;
The control of solid and liquid wastes by recycling on site or by removing them from the site for environmentally sensitive treat- ment elsewhere.
The use of a designated lorry route, and day- time working only, to avoid disturbance to village communities from construction lorry traffic and from night construction work.
Table 5.12 Mitigation measures, as outlined in UK guide to procedures
Where significant adverse effects are identified, [describe] the measures to be taken to avoid, reduce or remedy those effects,

be temporarily lost or damaged. It may be possible to repair, rehabilitate or restore the affected component to varying degrees. For example:
e.g:

(a)
(b)

site planning;
technical measures, e.g.:
(i)
process selection; (ii} recycling;

(iii} pollutkm control and treatment;
(iv} containment (e.g. bunding of storage vessels}.

•
Agricultural land used for the storage of (i)
mounding;

materials during construction may be fully rehabilitated; land used for gravel extraction may be restored to agricultural use, but over a much longer period and with associated impacts

according to the nature of the landfill material used.
(c} aesthetic and ecological measures, e.g.:
00 design, colour, etc.;
(iii) landscaping; (iv} tree plantings;
(v)
measure to preserve particular habitats or create alternative habitats;

(vi)
recording of archaeological sites;

(vii)
measures to safeguard historic buildings or sites. [Assess] the likely effectiveness of mitigating measures.

Source: DETR 2000

• The establishment of buffer zones and the

• A river or stream diverted by a road project can be unconverted and re-established with

similar flow patterns as far as is possible.

• A local community astride a route to a new tourism facility could be relieved of much of the adverse traffic effects by the construction of a bypass (which, of course, introduces a new flow of impacts).

There will invariably be some adverse effects that cannot be reduced. In such cases, it may be necessary to compensate people for adverse effects. For example:
minimal use of toxic substances, to avoid • For the loss of public recreational space or a impacts on local ecosystems. wildlife habitat, the provision of land with recreation facilities or the creation of a nature
Some adverse effects may be less easily avoided;
there may also be less need to avoid them • completely. Examples of methods to reduce adverse effects include:
reserve elsewhere.
For the loss of privacy, quietness and safety in houses next to a new road, the provision of sound insulation and/or the purchase by
the developer of badly affected properties.

• rhc sensitive design of structures, using simple profiles, local materials and muted colours, to reduce the visual impact of a development,

and landscaping to hide it or blend it into the local environment.

• The use of construction-site hostels, and

coaches for journeys to work to reduce the impact on the local housing market, and on the roads, of a project employing many workers during its construction stage.

• The use of silting basins or traps, the planting 5.4.2
Mitigation in the EIA process

of temporary cover crops and the scheduling of activities during the dry months, to reduce erosion and sedimentation.

During one or more stages of the life of a project, certain environmental components may

Mitigation measures can become linked with discussions between a developer and the local planning authority (LPA) on what is known in the UK as 'planning gain'. Fortlage (1990) talks of some of the potential complications associated with such discussions, and of the need to distinguish between mitigation measures and planning gain:

Before any mitigating measures are put forward, the developer and the local planning authority must agree as to which effects are to be regarded as adverse, or sufficiently adverse to warrant the expense of remedial work, otherwise the whole exercise becomes a bargaining game which is likely to be unprofitable to both parties ...
Planning permission often includes condi- tions requiring the provision of planning gains by the developer to offset some deteri- oration of the area caused by the develop- ment, but it is essential to distinguish very clearly between those benefits offered by way of compensation for adverse environmental effects and those which are a formal part of planning consent. The local planning auth- ority may decide to formulate the compen- sation proposals as a planning condition in order to ensure that they are carried out, so the developer should beware of putting for- ward proposals that he does not really intend to implement.

Mitigation measures must be planned in an integrated and coherent fashion to ensure that they are effective, that they do not cont1ict with each other and that they do not merely shift a problem from one medium to another. The results of a research project on the treatment of mitigation within EIA (DETR 1997) found that UK practice varied considerably. For example, there was too much emphasis on physical measures, rather than on operational or management controls, and a lack of attention to the impacts of construction and to residual impacts after mitigation. Table 5.13 provides a wider classification of mitigation, adopted in the project, by levels of mitigation, mitigation hierarchy and project phase. The levels relate to broad decisions that are made during the design of a project, with the last two reflecting the fact that effective mitigation can be achieved through measures other than physical ones. The mitigation hierarchy focuses on the principle of prevention rather than cure where, in principle at least, the options higher in the list
should be tried before those lower down the list. The project phases relate to the life cycle of the project first discussed in Chapter 1. Any particular mitigation measure can be classified in a combina- tion of the three ways - for example, physical design measures can be used to minimize an impact at source, during the construction phase (DETR 1997).

Like many clements in the ElA process, and as noted in Table 5.13, mitigation is not limited to one point in the assessment. Although it may follow logically from the prediction and assessment of the relative significance of impacts, it is in fact inherent in all aspects of the process. An original project design may already have been modified, possibly in the light of mitigation changes made to earlier comparable projects or perhaps as a result of early consultation with the LPA or with the local community. The consideration of alternatives, initial scoping activities, baseline studies and impact identification studies may suggest further mitigation measures. Although more in-depth studies may identify new impacts, mitigation measures may alleviate others. The prediction and evaluation exercise can thus focus on a limited range of potential impacts.
Mitigation measures are normally discussed and documented in each topic section of the EIS (e.g. air quality, visual quality, transport, employment). Those discussions should clarify the extent to which the significance of each adverse impact has been offset by the mitigation measures proposed. A summary chart (Table 5.14) can provide a clear and very useful overview of the envisaged out- comes, and may be a useful basis for agreement

Table 5. 13 A wider classification of mitigation

Levels of mitigation Mitigation hierarchy Project phase

- Alternatives (strategic, alternative locations and processes)

- Physical design measures

- Project management measures
- Deferred mitigation

- Avoidance at source
- Minimize at source
- Abatement on site
- Abatement at receptor
- Repair
- Compensa11on in kind
- Other compensation and enhancemen1

- Construction
- Commissioning
- Operation
- Decommissioning
- Restoration, afteruse/aftercare

Source: DETR 1997

Table 5.14 Example of a section of a summary table for impacts and mitigation measures

Impact Mitigation measure(s} Level of significance after mitigation

1. 400 acres of prime agricultural land would be lost from the county to accommodate the petrochemical plant.

2. Additional lorry and car traffic on the adjacent hilly section of the motorway will increase traffic volumes by 10-20 per cent above those predicted on the basis of current trends.

3. The project would block the movement of most

5.4.3
 Enhancement of potential benefits

5.5
 Summary

The only full mitigating measure for this impact would be to abandon the project.

A lorry crawler lane on the motorway, funded by the developer, will help to spread the volume, but effects may be partial and short-lived.
A wildlife corridor should be developed
Significant unavoidable impact

Significant unavoidable impact

Less than significant impact
terrestrial species from the hilly areas to the east and maintained along the entire length of of the site to the wetlands to the west of the site. the existing stream which runs through the site. The width of the corridor should be a minimum of 75 ft. The stream bed should be cleaned of silt and enhanced through the construction of occasional pools. The buffer zone should be planted with native riparian vegetation, including sycamore and willow.

on planning consents. Residual unmitigated or only partially mitigated impacts should be identi- fied. These could be divided according to the degree of severity: for example, into 'less than significant impacts' and 'significant unavoidable impacts'.
Mitigation measures are of little or no value unless they are implemented. Commitment to mitigation can be demonstrated through imple- mentation or management plans. These may take the form of an all-encompassing Environmental Management Plan (EMP) or Environmental Action Plan (EAP) (see Chapter 12); they may also include more specific sub-plans for particular impact types - see for example the following section for workforce and procurement plans to deliver socio-economic benefits. There is also a clear link between mitigation and the monitoring of out- comes, when a project is approved and moves to the construction and operational stages. Indeed, the incorporation of a clear monitoring pro- gramme can be one of the most important miti- gation measures. Monitoring, which is discussed in Chapter 7, must include the effectiveness or otherwise of mitigation and enhancement meas- ures. The measures must therefore be devised with
of particular mitigation measures may also draw on previous experience of relative effective- ness, from previous monitoring activity in other relevant and comparable cases.

UK guidance (DETR 1997) also notes the importance of including measures in EIA to create environmental benefits. Benefit enhancement is becoming an increasingly important clement in EIA, especially for major projects. Such enhance- ments can include biophysical actions - for example creating a nature reserve from an abandoned quarry that lies adjacent to a project site and which has been acquired by the developer. However they tend to be more often socio- economic actions related to socio-economic issues. A project may bring considerable benefit to an area, often socio-economically; where such benefits are identified, as a minimum there should be a concern to ensure that they do occur and do not become diluted, and that they may be enhanced. For example:
monitoring in mind; they must be clear enough • to allow for the checking of effectiveness. The use
The potential local employment benefits of a project can be encouraged and enhanced by the offer of appropriate skills training pro- grammes, apprenticeships, plus a 'one-stop- shop' local recruitment facility. for the con- struction stage of a project, this might be brought together in a Construction Workforce Management Plan, developed between the developer and key local stakeholders. The im- plementation of such a plan, with clear indi- cators and targets, can provide an important means of internalising employment benefits to the project host area,

reducing employment benefit leakage often associated with major projects.
Similarly, a procurement management plan could help to enhance opportunities for local contractors to benefit from a project. It could include supplier events to provide information on local contact opportunities with the project, improved local supply information for the developer such as an online database of local suppliers, and the employment of a supply chain officer to improve interactions with the local business sector.
In the housing domain, various tenure arrangements, construction site hostels/ campuses might have legacy use for the local area. A high quality construction site campus might have legacy use as an educational, recreational or even hotel facility. Vacated construction worker housing might provide valuable affordable housing for local people in need.
Similar legacy use might flow from transport activities associated with the construction, and possibly also the operation, of a major project. For example, to minimize car travel to a project construction site, there might be agreement with LPAs to build a park and ride facility, with connecting buses to the site. The buses might be used for other local needs between work start and end times - for example as local school buses. further, if conveniently located near to a town/city, the park and ride facility could be left in place for the use of the community after the end of project use.
For some large projects there are always likely to be some indirect disturbance effects and changes in lifestyle which are less easy to address directly. In an attempt to offer some compensation for such impacts with regard to Sizewell B nuclear power station, the CEGB as long ago as 1987 issued a Social Policy Statement (CEGB 1987) which included the provision for grants to be made available for various charitable, social and recreational projects of benefit to the local community, as part of a package of 'ameliorative measures'. Such measures were very well received by the local community. Elsewhere, and much more recently, there has been increasing focus on the development of Community Benefits Agreements/ Community Impacts Agreements to bring together packages of measures for locally impacted communities (Baxamusa 2008).

As for mitigation, the consideration of enhancement of impacts in EIA should be built in at an early stage of the process, building on wide stakeholder consultation. Enhancement measures should be clearly specified, and identified in management plans for subsequent monitoring of performance.

Impact prediction and the evaluation of the significance of impacts often constitute a 'black box' in EIA studies. Intuition, often wrapped up as expert opinion, cannot provide a firm and defensible foundation for this important stage of the process. Various methods, ranging from simple to complex, are available to the analyst, and these can help to underpin analysis. Mitigation and enhancement measures come into play particularly at this stage. However, the sophistication of some methods does run the risk of cutting out key actors, and especially the public, from the EIA process. Chapter 6 discusses the important, but currently weak, role of public participation, the value of good presentation, and approaches to EIS review and decision-making.

SOME QUESTIONS

The following questions are intended to help the reader focus 011 the key issues of this chapter.

1. Magnitude of impact is not always synonymous with significance of impact. Provide examples from your experience to illustrate this point.

2. Assess the case for using expert judgement as a key prediction method in EIA.

3. Similarly, examine the case for using causal network analysis in EIA.

4. How can uncertainty in the prediction of impacts be handled in EIA? Consider the merits of different approaches.

5. Consider the value of the qualitative multi-criteria decision analysis (MCDA) exemplified in Figure 5.9, for various stakeholder groups, for assessing the trade-offs between different types of impacts.

6
Examine the application of the mitigation hierarchy to the impacts of a major project with which you are familiar. What constraints might there be in following the logical steps in that hierarchy in practice?

7
The enhancement of beneficial impacts has had a low profile in EIA until recently. Why do you think this has been so, and why is the situation now changing?

8
Consider what might be included in a Community Benefits Agreement for (a)
a major wind farm development in a remote rural location; and

(b)
the redevelopment of a major football (soccer) stadium in a heavily populated urban area.

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6 Participation, presentation and review

6. 1 Introduction

One of the key aims of the EIA process is to provide information about a proposal's likely environ- mental impacts to the developer, public, statutory consultees and decision-makers, so that a better decision may be made. Consultation with the public and statutory consultees in the EIA process can help to improve the quality, compre- hensiveness and effectiveness of the EIA, as well as ensuring that the various groups' views are adequately taken into consideration in the decision-making process. Consultation and participation can be useful at most stages of the EIA process:

- in determining the scope of an EIA;
- in providing specialist knowledge about the site;
- in suggesting alternatives;
- in evaluating the relative significance of the likely impacts;
- in proposing mitigation measures;
- in ensuring that the EIS is objective, truthful and complete; and
- in monitoring any conditions of the develop- ment agreement.

6.2 Public consultation and participation

6.2.1 Advantages and disadvantages of public participation

6.2.2 Requirements and methods for effective participation

As such, how the information is presented, how the various interested parties use that information, and how the final decision incorporates the results of the EIA and the views of the various parties, arc essential components in the EIA process.

Traditionally, the British system of decision- making has been characterized by administra- tive discretion and secrecy, with limited public input (McCormick 1991). However, there have been moves towards greater public participation in decision-making, and especially towards greater public access to information. In the environ- mental arena, the UK Environmental Protection Act of I990 requires the Environment Agency and local authorities to establish public registers of information on potentially polluting pro- cesses; Neigilbourhood statistics, data.gov.uk and other government data sources provide environ- mental data in a publicly available form; the public participation requirements of the Aarhus Con- vention, 2003 amendments to the EIA and SEA Directives, and Planning Act 2008 allow greater public access to information previously not com- piled, or considered confidential; and Directive 2003/4/EC, which requires Member States to make provisions for freedom of access to information on the environment, has been implemented in the UK through the Environmental Information

Regulations 2004. The 2009 review on the opera- tion of the 2003 amended EIA Directive (CEC 2009) provided some positive feedback on public participation, especially from the new Member States, which, overall, see the EIA directive as contributing directly to the consolidation of democratic development by securing fundamental rights based on improvements in public participa- tion rights and adding transparency in decision making.

However, despite the positive trends towards greater consultation and participation in the EIA process and the improved communication of EIA findings, both arc still relatively underdeveloped in the UK. Few developers make a real effort to gain a sense of the public's views before presenting their applications for authorization and E!Ss. Few competent authorities have the time or resources to gauge public opinion adequately before making their decisions. Few E!Ss are presented in a manner that encourages public participation.

This chapter discusses how consultation and participation of both the public (Section 6.2) and statutory consultees (Section 6.3) can be fostered, and how the results can be used to improve a proposed project and speed up its authorization process. The effective presentation of the EIS is then discussed in Section 6.4. The review of EISs and assessment of their accuracy and comprehen- siveness are considered in Section 6.5. The chapter concludes with a discussion about decision-making and post-decision legal challenges.

This section discusses how 'best practice' public participation can be encouraged.1 It begins by considering the advantages and disadvantages of public participation. It then discusses dimensions of effective public participation and reviews methods for such participation. Finally, it discusses the UK approach to public participation, including the changes brought about by the Planning Act 2008. The reader is also referred to the Audit Commission (2000) and IEMA (2002) for further information on public participation; and to the NGO Forum on ADB (2006) for a good example of

a guide to EIA participation written with the public in mind.

Developers do not usually favour public partici- pation. It may upset a good relationship with the LPA. It carries the risk of giving a project a high profile, with attendant costs in time and money. It may not lead to a conclusive decision on a project, as diverse interest groups have different concerns and priorities; the decision may also represent the views of the most vocal interest groups rather than of the general public. Most developers' contact with the public comes only at the stage of planning appeals and inquiries; by this time, participation has often evolved into a systematic attempt to stop their projects. Thus, many developers never see the positive side of public participation.

Historically, public participation has also had connotations of extremism, confrontation, delays and blocked development. In the USA, NEPA- related lawsuits have stopped major development projects, including oil and gas developments in Wyoming, a ski resort in California and a clear- cut logging project in Alaska (Turner 1988). In Japan in the late 1960s and early l 970s, riots so violent that six people died delayed the construc- tion of the Narita Airport near Tokyo by five years. In the UK, perhaps the most visible forms of public 'participation' have been protesters wearing gas masks at nuclear power station sites, being forcibly evicted from tunnels and tree houses on the Newbury bypass route (which cost more than £6 million for policing before construction even began), and setting up a protest camp at Simpson where a third Heathrow runway would have been built. More typically, all planners are familiar with acrimonious public

meetings and 'ban the project' campaigns. Public participation may provide the legal means for intentionally obstructing develop- ment; the protracted delay of a project can be an effective method of defeating it.
On the other hand, from a developer's point of view, public participation can be used positively to convey information about a development, clear up misunderstandings, allow a better under- standing of relevant issues and how they will be
dealt with, and identify and deal with areas of controversy while a project is still in its early planning phases. The process of considering and responding to the unique contributions of local people or special interest groups may suggest measures the developer could take to avoid local opposition and environmental problems. These measures are likely to be more innovative, viable and publicly acceptable than those proposed solely by the developer. Project modifications made early in the planning process, before plans have been fully developed, are more easily and cheaply accommodated than those made later. Projects that do not have to go to inquiry arc considerably cheaper than those that do. Early public partici- pation also prevents an escalation of frustration and anger, so it helps to avoid the possibility of
more forceful 'participation'; Figure 6.1 shows three quite different examples of participation in ElA. l'hc implementation of a project generally proceeds more cheaply and smoothly if local residents agree with the proposal, with fewer protests, a more willing labour force, and fewer complaints about impacts such as noise and traffic.
For instance, the conservation manager of Europe's (then) largest zinc/lead mine noted that:

properly defined and widely used, IEIA isl an advantage rather than a deterrent. It is a mechanism for ensuring the early and orderly consideration of all relevant issues and for the involvement of affected communities. It is in this last area that its true benefit lies. We have entered an era when the people decide. It is

Figure 6.1

Different forms of public 'participation': (a) public meeting aboul the proposed Hinkley 'C' nuclear power slation; (b) protest agains1 the proposed Southampton biomass plant; (c) some Newbury bypass route protest melhods
Sources: (a) EDF Energy 2009; (b) Daily Echo 2011; (c) Guardian 1996
therefore in the interests of developers to ensure that they, the people, are equipped to do so with the confidence that their concern is recognized and their future life-style protected. (Dallas I 984)

Similarly, the developers of a motor-racing circuit noted:

The [EIS) was the single most significant factor in convincing local members, residents and interested parties that measures designed to reduce existing environmental impacts of motor racing had been uppermost in the
with the development and government on man- agement of their cultural heritage. This, in turn, can change the power balance in favour of groups that have traditionally been marginalized. Table 6.1 summarizes the main aims of public participation in EIA.

The United Nations Environment Programme lists five interrelated components of effective public participation:
formulation of the new proposals. The ex ten- • sive environmental studies which formed the basis of the statement proved to be a robust defence against the claims from objectors • and provided reassurance to independent bodies such as the Countryside Commission • and the Department of the Environment.
Had this not been the case, the project would • undoubtedly have needed to be considered at a public inquiry. (Hancock 1992) •

From the public's point of view, participation
identification of the groups/individuals inter- ested in or affected by the proposed develop- ment;
provision of accurate, understandable, perti- nent and timely information;
dialogue between those responsible for the decisions and those affected by them; assimilation of what the public say in the decision; and
feedback about actions taken and how the public influenced the decision. (Clark 1994)
in an EIA process can increase people's say in decision-making, thus improving governance and making decision-making more democratic. For instance, O'Faircheallaigh (2010) cites cases where indigenous people would not release information unless they were fully informed about the

proposed project and given the opportunity to negotiate
These points will be discussed in turn.
Although the identification of" relevant interest groups seems superficially simple, it can be fraught with difficulty. The simple term 'the public' actually refers to a complex amalgam of interest groups, which changes over time and from project to project. ·1 he public can be broadly classified

Table 6.1 Purposes for public participation in EIA Broad purpose Specific purposes and activities

Obtain public input into decisions taken elsewhere

Share decision making with public

Alter distribution of power and structures of decision making

1
Provide information to public

2
Fill information gaps

3
Information contestabili1y/testing information provided by the developer

4
Problem-solving and social learning

5
Refled democratic principles/EIA used to obtain the consent of those aHeded

6
Democracy in practice/participation as an educative function

7
Pluralist representation

8
Involve marginalised groups (or, alternatively, entrench marginalization)

9
Shift the locus of decision making, e.g. to agreements between developers and local people

Source: Adapted from 0'Faircheallaigh 2010

into two main groups. The first consists of the voluntary groups, quasi-statutory bodies or issues- based pressure groups that arc concerned with a specific aspect of the environment or with the environment as a whole. The second group consists of the people living near a proposed development who may be directly affected by it. These two groups can have very different interests and resources. The organized groups may have extensive financial and professional resources at their disposal, may concentrate on specific aspects of the development, and may see their participa- tion as a way to gain political points or national publicity. People living locally may lack the technical, educational or financial resources, and familiarity with relevant procedures to put their points across effectively, yet they are the ones who will be the most directly affected by the develop- ment (Mollison 1992). The people in the two groups, in turn, come from a wide range of backgrounds and have a wide variety of opinions. A multiplicity of 'publics' thus exits, each of which has specific views, which may well conflict with those of other groups and those of EIA 'experts'.

It is debatable whether all these publics should be involved in all decisions; for instance, whether 'highly articulate members of the NGO, Green- peace International, sitting in their office in Holland, also have a right to express their views on, and attempt to influence, a decision on a project that may be on the other side of the world' (Clark 1994). Participation may be rightly controlled by regulations specifying the groups and organizations that are eligible to participate or by criteria identifying those considered to be directly affected by a development (e.g. living within a certain distance of it). For instance, under the Planning Act 2008, 'affected persons' who own or manage the land proposed for development are treated differently from more generally 'interested parties'.

rhe EIA Directive distinguishes between (1) 'the public', who must be informed of the request for development consent, the availability of accompa- nying environmental information, the nature of the possible decision, and details of arrangements for public consultation (Article 6.2); and (2) 'the public concerned', to whom the environmental statement, main advice and reports issued to the competent authority, and other relevant information must be made available, and who must be given an early and effective opportunity to participate in the environmental decision- making procedures (Articles 6.3 and 6.4). Although all Members States seem to use a broad definition for the former, many are more restrictive for the latter. Different Member States permit NGOs to participate in the EIA process depending on how long they have existed, their regional coverage, whether environmental protection is one of their objectives, or whether they arc legal entities (COWi 2009).

Lack of information, or misinformation, about the nature of a proposed development prevents adequate public participation and causes resent- ment and criticism of the project. One objective of public participation is thus to provide i11forma- tio11 about the development and its likely impacts. Before an EIS is prepared, information may be provided at public meetings, exhibitions or tele- phone hotlines. This information should be as candid and truthful as possible: people will be on their guard against evasions or biased informa- tion, and will look for confirmation of their fears. A careful balance needs to be struck between consultation that is early enough to influence decisions and consultation that is so early that there is no real information on which to base any discussions. For instance, after several experi- ences of problematic pre-EIS consultation, one UK developer decided to conduct quite elaborate consultation exercises, but only after the EISs were published (McNab I 997). The Infrastruc- ture Planning Commission publishes all of its communications from and with any parties on its website, to avoid any accusations of bias and behind-the-scenes dealings.

The way information is conveyed can influence public participation. Highly technical information can be understood by only a small proportion of the public. Information in different media (e.g. newspapers, radio) will reach different sectors of the public. Ensuring the participation of groups that generally do not take part in decision-making - notably minority and low-income groups - may be a special concern, especially in the light of the Brundtland Commission's emphasis on intra- generational equity and participation. Ross (2000) gives a compelling example of the difficulties of communicating technical information across a language barrier in Canada:

At one of the hearings in an aboriginal community, there was a discussion of chlorinated organic emissions involving one of the ciders, who was speaking in Cree through a translator. The translator needed to convey the discussions to the Elder. The difficult question was how to translate the phrase 'chlorinated organic compounds' into Cree. Fellow panel member Jim Boucher ... who spoke Cree, listened to the translator, who had solved the problem by using the translation 'bad medicine'.

Williams and Hill (1996) identified a number of disparities between traditional ways of communicating environmental information and the needs of minority and low-income groups in the US. For instance agencies:

- focus on desk studies rather than working actively with these groups;
- often do not understand existing power structures, and so do not involve community leaders such as preachers for low-income churches, or union leaders;

- hold meetings where the target groups are not represented, for instance in city centres away from where the project will be located;
- hold meetings in large 'fancy' places which disenfranchised groups feel are 'off-limits', rather than in local churches, schools or community centres;
- use newspaper notices, publication in official journals and mass mailings instead of telephone trees or leaflets handed out in schools;
- prepare thick reports which confuse and overwhelm; and
- use formal presentation techniques such as raised platforms and slide projections.

These points suggest that a wide variety of methods for conveying information should be used, with an emphasis on techniques that would be useful for traditionally less participative groups: EIS summaries with pictures and maps as well as technical reports, meetings in less formal venues, and contact through established community networks, as well as through leaflets and newspaper notices.

Public participation in EIA also aims to establish a dialogue between the public and the decision- makers (both the project proponent and the authorizing body) and to ensure that decision- makers a.Himilate the public's views into their decisions. It can help to challenge the under- lying assumptions behind an EIS, its balance and veracity, and the alternatives it considers (O'Faircheallaigh 2010). Public participation can help to identify issues that concern local residents. These issues are often not the same as those of concern to the developer or outside experts. Public participation exercises should thus achieve a two-way flow of information to allow residents to voice their views. The exercises may well identify conflicts between the needs of the developer and those of various sectors of the community; but this should ideally lead to solutions of these conflicts, and to agreement on future courses of action that reflect the joint objectives of all parties (Petts 1999, 2003).

Effective public participation methods could include deliberative techniques, such as focus groups, Delphi panels and consultative commit- tees, plus appropriate resourcing, perhaps through intervenor funding. Petts (2003) highlights some of the possibilities and problems of deliberative participation, or communication through dialogue; she also stresses the need for such participation to be integral to the EIA process rather than an 'add- on'. Halram et al. (2003) provide an interesting development of the Delphi approach, Collaborative Spatial Delphi, using a GIS-based approach, and there may be considerable potential for using spatial technology in participation in EIA. There is then of course the great potential of the continuously and rapidly evolving Internet and social networking systems. As discussed in the Hong Kong case study in Section 7.3, the Internet can be used to facilitate participation at several stages in the EIA process.

Arnstein (1971) identified 'eight rungs on a ladder of citizen participation', ranging from non-participation (manipulation, therapy), through tokenism (informing, consultation, placation), to citizen power (partnership, delegated power, citizen control). Assimilation of what the public say in the decision is likely to be higher the further up

Table 6.2 Advantages and disadvantages of levels of increasing public influence

Approaches	Extent	Advantages	Disadvantages
Information feedback			

Film or Powerpoint presentation, television, information kit, newspaper account or advertisement, news conference, press
Nil
Informative, quick presentation subject to bias
No feedback

release, print materials, technical report,

website, notice, etc.

Consultation
Public hearing, briefing, ombudsperson or

Low

Allows two-way information

Does not permit ongoing

representative, survey, interview, response

transfer; allows limited
communication; somewhat

sheets, etc.

discussion
lime-consuming

Joint planning
Advisory committee, workshop, informal meeting,

Moderate

Permits continuing input and

Very time-consuming;

role playing, panels, interactive polling, future search conference, etc.

feedback; increases education and involvement
of citizens
dependent on what information is provided
by planners

Delegated authority

Citizens' review board, Citizens' planning
High
Permits better access to
Long-term lime

commission etc

relevant information; permits greater control over options and timing of decision.
commitment; difficult to include wide representation on small board.

Source: Adapted from: Westman 1985; International Association for Public Participation 2001

the ladder one goes. Similarly, Westman (1985) has identified four levels of increasing public power in participation methods: information-feedback approaches, consultation, joint planning and dele- gated authority. Table 6.2 lists advantages and disadvantages of these levels.

There are many different forms of public participation. A few are listed in Table 6.3, along with an indication of how well they provide information, cater for special interests, encourage dialogue and affect decision-making.

However, different stakeholders may have very different views on how effective a given EIA process is in influencing a planning decision. Hartley and Wood (2005) interviewed 22 stakeholders - planning officers, a developer, local action group members, and members of the public - involved in the EIAs for four waste disposal sites. Although the different types of stakeholders had broadly similar views on many aspects of the EIA public participation process (e.g. timing, information provision), they differed significantly in their views of its influence on decision-making:

The planning officers in all the case studies indicated that public representations are carefully considered in the decision-making process and that suggestions from the public are often used when formulating planning conditions ... However, members of action groups believed that their influence on the final decision was limited, that the planning process was too political and that decisions had largely been made before they were informed ...

Finally, an essential part of effective public participation is feedback about any decisions and actions taken, and how the public's views affected those decisions. In the US, for instance, comments on a draft EIS are incorporated into the final EIS along with the agency's response to those comments. for example:

- Comment: I am strongly opposed to the use of herbicides in the forest. I believe in a poison-free forest!

Table

Provide
Cater for special
Two-way
Impact decision-

information
interests
communication
making

Explanatory meeting, slide/film presentation

½
½

Presentation to small groups

½

Public display, exhibit, models

Press release, legal notice

Written comment
½
½
½

h

Field office

½

Site visit

Advisory comm,ttee, task force, community representatives h
h

Working groups of key actors
Citizen review board h
½
h

Public inquiry
½
½
I-

Litigation h

½
/-

Demonstration, protest, riot

½
/-

Source: Adapted from Westman 1985

•

Response: Your opposition to use of herbicides • was included in the content analysis of all comments received. However, evidence in the 6.2.3
UK procedures

EIS indicates that low-risk use of selected herbicides is assured when properly controlled - the evaluated herbicides pose minimal risk as long as mitigation measures are enforced. Without such feedback, people are likely to question the use to which their input was put, and whether their participation had any effect at all; this could affect their approach to subsequent projects as well as their view of the one under consideration.

Articles 6 and IO(a) of EC Directive 85/337 (as amended by Directives 97/11 and 2003/35/EC) requires Member States to ensure that:

- The public is notified early in the environ- mental decision-making procedures about the request for development consent, the fact that the project is subject to EIA, and information about how they can participate in the EIA

The public concerned is given the opportunity to express an opinion before development consent is granted. The detailed arrangements for such information and consultation are determined by the Member States which may, depending on the particular characteristics of the projects or sites concerned:
determine the public concerned;
specify the places where the information can be consulted;
specify the ways in which the public may be informed, for example, by bill posting within a certain radius, publication in local newspapers, organization of exhibi- tions with plans, drawings, tables, graphs and models;
determine the manner in which the public is to be consulted, for example by written submissions or by public enquiry; and
fix reasonable time limits for the various stages of the procedure in order to ensure that a decision is taken within a reason- able period.
process.

- Copies of the environmental information and other information relevant to the decision are made available to the public.

- Members of the public who have a sufficient interest or whose rights are impaired have access to a decision review procedure before a court of law.

In the UK, this has been translated by the various EIA regulations (with minor differences) into the following general requirements. Notices must be published in a local newspaper and posted at a proposed site at least seven days before the submission of the development application and EIS. These notices must describe the proposed development, state that a copy of the EIS is available for public inspection with other docu- ments relating to the development application, give an address where copies of the EIS may be obtained and the charge for the EIS, and state that written representations on the application may be made to the competent authority for at least 21 days after the notice is published. When a charge is made for an EIS, it must be reasonable, taking into account printing and distribution costs.
Environmental impact assessment: g11ide to the
procedures (DETR 2000), the government manual to developers, notes:

Developers should also consider whether to consult the general public, and non-statutory bodies concerned with environmental issues, during the preparation of the environmental statement. Bodies of this kind may have particular knowledge and expertise to offer
... W hilc developers arc under no obligation to publicise their proposals before submitting a planning application, consultation with local amenity groups and with the general public can be useful in identifying key envir- onmental issues, and may put the developer in a better position to modify the project in ways which would mitigate adverse effects and recognize local environmental con- cerns. It will also give the developer an early indication of the issues which arc likely to be important at the formal application stage if, for instance, the proposal goes to public inquiry.

This suggests that, although the UK has broadly implemented the EIA Directive's minimal require- ments for public participation, this has been done half-heartedly at best, with no extension ('gold plating') of these requirements. The European Commission (EC 2010a) has also formally warned the UK about the prohibitive expense for members of the public who wish to challenge the legality
of decisions on the environment, and this may still result in a judicial review. However the UK is not unusual in this respect: a recent review of the application and effectiveness of the EIA Directive (CEC 2009) concluded that public participation practice varies widely across European Member States, with most Member States adhering only to the Directive's minimum requirements.
The situation for nationally significant infra- structure projects is different from that described above. The Planning Act 2008 requires that decisions about such projects are made by a new Infrastructure Planning Commission in accordance with new National Policy Statements, with more 'front loaded' and exigent public participation requirements.2 Developers for such projects need to demonstrate that they have undertaken public consultation and acted on public feedback before they submit an application to the IPC. The IPC then has 28 days to accept or reject the proposal, and inadequate consultation is one of the criteria for rejecting proposals. If an application is accepted, the public can register to provide their views in writing to the IPC, and to participate in open-floor and special topic hearings. All of the EIA-related documents are put on the IPC website.

6 .3 Consultation with statutory consultees and other countries

Statutory consultees have accumulated a wide range of knowledge about environmental condi- tions in various parts of the country, and they can give valuable feedback on the appropriateness of a project and its likely impacts (Wende 2002; Wood and Jones 1997). However, the consultees may have their own priorities, which may prejudice their response to the EIS.
Article 6(1) of Directive 85/337 (as amended) states:

Member States shall take the measures necessary to ensure that the authorities likely to be concerned by the project by reasons of their specific environmental responsibilities
are given an opportunity to express their opinion on the information supplied by the developer and other requests for develop- ment consent. To this end, Member States shall designate the authorities to be consulted
... The information gathered ... shall be for- warded to those authorities. Detailed arrange- ments for consultation shall be laid down by Member States.

In the UK, different statutory consultees have been designated for different devolved administra- tions (England, Wales, Scotland and Northern Ireland) and different types of development. For planning projects in England, for instance, the statutory consultees are any principal council to the area in which the land is situated (if not the LPA), Natural England, and the MMO and the Environment Agency where relevant.
The EIA Directive also requires consultation of other European Member States. Where one Member State is aware that a project is likely to have significant environmental impacts in another Member State - or if requested by a Member State that is likely to be significantly affected - the first Member State must send to the affected Member State information on the project, its likely impacts and the decision that will be taken. If the affected Member State subsequently indicates that it wants to participate in the EIA process, then it subse- quently must be treated essentially as though it was a statutory consultee. The UK has had a limited number of these transboundary consultations -12 by 2009, compared to the Republic of Ireland, which had the most at 43 (COWi 2009).
Ideally, consultees should already be consulted at the scoping stage. In addition, it is a legal

requirement that the consultees should be consulted before a decision is made. Once the EIS is completed, copies can be sent to the consultees directly by the developer or by the competent authority. In practice, many competent authori- ties only send particular EIS chapters to the consultees (e.g. the chapter on archaeology to the archaeologist). However, this may limit the consultee's understanding of the project context and wider impacts; generally consultees should be sent a copy of the entire EIS.

Although EIA legislation specifies the minimum contents required in an EIS, it does not give any standard for the presentation of this information. Past EJSs have ranged from a three-page typed and stapled report to glossy brochures with computer graphics and multi-volume documents in purpose- designed binders. This section discusses the contents, organization, and clarity of communica- tion and presentation of an EIS.

opinion on the information supplied by the
developer and other requests for develop-
ment consent. To this end, Member States
EIA. The EIS should set the context of the issues. The names of the developer, relevant consultants, relevant LPAs and consultees should be listed, along with a contact person for further informa- tion. The main relevant planning issues and legislation should be explained. The EIS should also indicate any references used, and give a bibliography at the end.
The 1zo11-tec/111ical rnmmary is a particularly important component of the EIS, as this is often the only part of the document that the public and decision-makers will read. It should thus summarize the main findings of the EIS, including the project description, alternatives and proposed mitigation measures. Chapter 4 gave examples of techniques for identifying and summarizing impacts, and Table 6.4 shows how the impacts of a project can be summarized.
An EIS should ideally be one unified dowment, with perhaps a second volume for appendices. The courts have stated that an EIS should not be a 'paper chase' (Berkeley vs. Sos and Fulham Football Club, 2001):
the point about the environmental statement contemplated by the Directive is that it constitutes a single and accessible compila- tion, produced by the applicant at the very start of the application process, of the relevant environmental information and the summary in non-technical language.

A common problem with the organization of EISs stems from how environmental impacts are assessed. The developer (or the consultants co- ordinating the EIA) often subcontracts parts of the ElA to consultancies that specialize in those fields (e.g. ecological specialists, landscape consultants). These in turn prepare reports of varying lengths and styles, making a number of (possibly different) assumptions about the project and likely future environmental conditions, and proposing different and possibly conflicting mitigation measures. One way developers have attempted to circumvent this problem has been to summarize the impact predictions in a main text, and add the full reports as appendices to the main body of the EIS. Another

Table 6.4 Extract from an EIS summary table showing relative weights given to significance of impacts

Topic area
Description
Geographical
Impact
Nature
Signikance

N R D L

Human beings
Disturbance to existing properties

Adverse

St, R
Major

from traffic and noise

Coalescence of existing settlements

Adverse
Lt, IR

Flora and fauna
Loss of grassland of local nature

Adverse
Lt, IR
Minor

conservation value

Creation of new habitats

Beneficial
Lt, R
Minor

Increased recreational pressure on SSSI

Adverse
Lt, R
Minor

Soil and geology
Loss of 120 hectares agricultural soil (grade 38)

Adverse
Lt, IR
Minor

Water
Increased rates of surface water run-off

Adverse
Lt, IR
Minor

Reduction in groundwater recharge

Adverse
Lt, R
Minor

Key: I International
N National R Regional D District L Local
St Short term Lt Long term R Reversible IR Irreversible

Source: DoE 1995
Note: only a selection of key issues are given here
has been to put a 'company cover' on each report and present the EIS as a multi-volume document, each volume discussing a single type of impact. Both of these methods are problematic: the appendix method in essence discounts the great majority of findings, and the multi-volume method indicated, perhaps in a table at the front or back.
An EIS should avoid technical jargon. Any jargon it does include should be explained in the text or in footnotes. All the following examples arc from actual EISs:
is cumbersome to read and carry. Neither method • attempts to present findings in a cohesive manner, emphasizes crucial impacts or proposes a coherent package of mitigation and monitoring measures.
A good EIS would incorporate the information from the subcontractors' reports into one coherent document, which uses consistent assumptions and proposes consistent mitigation measures.
The EIS should be kept as brief as possible while • still presenting the necessary information. The main text should include all the relevant discussion about impacts, and appendices should present only additional data and documentation. In the US,
the length of an EIS is generally expected to be less than 150 pages.

Weiss (1989) suggests that an unreadable EIS is an
Wrong: It is believed that the aquiclude properties of the Brithdir seams have been reduced and there is a degree of groundwater communication between the Brithdir and the underlying Rhondda beds, although ... numerous seepages do occur on the valley flanks with the retention regime dependent upon the nature of the superficial deposits. Right: The accepted method for evaluating the importance of a site for waterfowl (i.e. waders and wildfowl) is the '1 per cent criterion'. A site is considered to be of National Importance if it regularly holds at least 1 per cent of the estimated British population of a species of waterfowl. 'Regularly' in this context means counts (usually expressed as annual peak figures), averaged over the last five years.

The EIS should clearly state any assumptions on
environmental hazard: which impact predictions arc based:

The issue is the quality of the document, its • usefulness in support of the goals of envir-onmental legislation, and, by implication,
the quality of the environmental steward-
Wrong: As the proposed development will extend below any potential !archaeological) remains, it should be possible to establish a method of working which could allow ade-
ship entrusted to the scientific community quate archaeological examinations to take
... An unreadable EIS not only hurts the place.
environmental protection laws and, thus, • Right: for each operation an assumption has the environment. It also turns the sincere been made of the type and number of plant environmental engineer into a kind of involved. These are: demolition: 2 pneumatic 'polluter'. breakers, tracked loader; excavation: backacter
excavator, tracked shovel ...
An EIS has to communicate information to many audiences, from the decision-maker to the environmental expert to the lay person. Although it cannot fulfil all the expectations of all its readers, it can go a long way towards being a useful document for a wide audience. It should at least be well written, with good spelling and punctuation.

The EIS should be specific. Although it is easier and more defensible to claim that an impact is significant or likely, the resulting EIS will be little more than a vague collection of possible future trends.
It should have a clear structure, with easily visible • titles and a logical flow of information. A table of contents, with page numbers marked, should be included before the main text, allowing easy access
has

Ri,i:ht: From these [specified] sections of road, large numbers of proposed wind turbines would be visible on the skyline, where the towers would appear as either small or indistinct objects and the movement of rotors would attract the attention of road users. The
impacts that they should be stopped (otherwise one would hope that they would already have been stopped). However, it is unlikely that all major environmental issues will have been resolved by the time the statement is written.
change in the scenery caused by the proposals • would constitute a major visual impact, mainly due to the density of visible wind turbine rotors.

Predicted impacts should be quantified if possible, perhaps with a range, and the use of non-
Wrong: The proposed site lies adjacent to lagoons, mud and sands which form four regional Special Sites of Scientific Interest [s,c]. The loss of habitat for birds is unlikely to be significant, owing to the availability of similar habitats in the vicinity.
quantified descriptions, such as severe or minimal, should be explained:

- Wrong: The effect on residential properties will be minimal with the nearest properties

... at least 200 m from the closest area of filling.

- Right: Without the bypass, traffic in the town centre can be expected to increase by about

50--75 per cent by the year 2008. With the bypass, however, the overall reduction to 65-75 per cent of the 1986 level can be achieved.

Even better, predictions should give an indication o(the probability that an impact will occur, and the degree of confidence with which the prediction can be made. In cases of uncertainty, the EIS should propose worst-case scenarios:

- T<ight. In terms of traffic generation, the 'worst case' scenario would be for 100 per cent usage of the car park ... For a more realistic analysis, a redistribution of SO per cent has been assumed.

6.4.3 Presentation

6.5 Review of EISs

(c) Test of relevance and then completeness

6.6 Decisions on projects 6.6.1

1 EIA and project authorization

6.6.2 EIA and public inquiries

6.6.3 Challenging a decision: judicial

6.6.4 Challenging a decision: the European Commission

6.7

Finally, an EIS should be honest and unbiased. A 1991 review of local authorities noted that '[a] number of respondents felt that the environmental statement concentrated too much on supporting the proposal rather than focusing on its impacts and was therefore not sufficiently objective' (Kenyan 1991). O'Faircheallaigh (2010) suggests that lack of objectivity is still a problem, with EISs being used to justify, not assess, decisions. Developers cannot be expected to conclude that their projects have such major environmental

Although it would be good to report that EISs are read only for their contents and clarity, in reality, presentation can have a great influence on how they are received. EIAs are, indirectly, public relations exercises, and an EIS can be seen as a pub- licity document for the developer. Good presenta- tion can convey a concern for the environment, a rigorous approach to the impact analysis and a positive attitude to the public. Bad presentation, in turn, suggests a lack of care, and perhaps a lack of financial backing. Similarly, good presentation can help to convey information clearly, whereas bad presentation can negatively affect even a well- organized EIS.

The presentation of an EIS will say much about the developer. The type of paper used - recycled or not, glossy or not, heavy or light weight - will affect the image projected, as will the choice of coloured or black-and-white diagrams and the use of dividers between chapters. The ultra-green company will opt for double-sided printing on recycled paper, while the luxury developer will use glossy, heavyweight paper with a distinctive binder. Generally, a strong binder that stands up well under heavy handling is most suitable for EISs. Unless the document is very thin, a spiral binder is likely to snap or bend open with con- tinued handling; similarly, stapled documents are likely to tear. Multi-volume documents arc difficult to keep together unless a box is provided. EISs can also be made public on the Internet or through CDs (see Figure 6.2).

The use of maps, graphs, photo-montages, diagrams and other forms of visual communication can greatly help the EIS presentation. As we noted

Figure 6.2

Different types of EIS presentation

Sources: (a) Metropolitan Council (Minneapolis/St Paul}; (b) /'REVA Resources Canada Inc.; (c) Gritt Wigley; (d) Evelop

in Chapter 4, a location map, a site layout of the project and a process diagram are essential to a proper description of the development. Maps showing, for example, the extent of visual impacts, the location of designated areas or classes of agricultural land are a succinct and clear way of presenting such information. Graphs are often much more effective than tables or figures in conveying numerical information. Forms of visual communication break up the page, and add interest to an EIS. Increasingly some developers are also producing the EIS as a CD, and putting it on the Internet.

A range of stakeholders will want to check the accuracy and comprehensiveness of an EIS. The developer will want to ensure that they are not vulnerable to legal challenge. Opponents of the scheme will want to see whether it is. Statutory consultees will want to ensure that it covers

all the relevant information on their topics of interest in a fair manner. The local planning authority will want to confirm that it is 'fit for purpose' for informing its decision.
The DCLG (2011) guidance notes that the competent authority must satisfy itself of the adequacy of the EIS, but gives no information on how it should do this:

LPAs should satisfy themselves that submitted ES contains the information specified in Part II of Schedule 4 to the Regulations and the relevant information set out in Part I of that Schedule that the applicant can reasonably be required to compile. To avoid delays in determining EIA applications, the need for any further information should be considered and, if necessary, requested as early as possible. It is important to ensure that all the information needed to enable the likely significant environmental effects to be properly assessed is gathered as part of the EIA process. If tests or surveys arc needed to establish the likelihood or extent of significant environmental effects, the results of these should form part of the ES ... Whether there is a breach of the regulations through failing to include the outcomes of surveys in an ES depends on the level of information already at the LPA's disposal, and whether this is sufficient to enable the authority to make an informed judgment as to the likely significant effects.

As will be shown in Chapter 8, many EISs do not meet even the minimum regulatory require- ments, much less provide comprehensive informa- tion on which to base decisions. In some countries, for example the Netherlands, Canada, Malaysia and Indonesia, EIA Commissions or panels have been established to review EISs and act as a quality assurance process. However, in the UK there are no mandatory requirements regarding the pre- decision review of EISs to ensure that they are comprehensive and accurate. A planning applica- tion cannot be judged invalid simply because it is accompanied by an inadequate or incomplete EIS: a competent authority may only request further information, or refuse permission and risk an appeal.3
Many competent authorities do not have the full range of technical expertise needed to assess the adequacy and comprehensiveness of an EIS. Some authorities, especially those that receive few
EISs, have consequently had difficulties in dealing with the technical complexities of EISs. In some cases, consultants are brought in to review the EISs. Other authorities have joined the Institute of Environmental Management and Assessment (IEMA), which reviews EISs. Others have been reluctant to buy outside expertise, especially at a time of restrictions on local spending.
A technique advocated by the International Association for Impact Assessment (IAIA), although not seen often in practice, is to involve parties other than just the competent authority in EIS review, especially the public (Partidario 1996).
In an attempt to fill the void left by the national government, several organizations have devised non-mandatory review criteria that aim to ensure that EJSs analyse and present all relevant information and (to a lesser extent) that this information is accurate. Such a review also allows the reader to become familiar with the proposed project, assess the significance of its effects, and determine whether mitigation of its impacts is needed. Indirectly, it also makes the reviewer more familiar with the EIA process. The review process can be used by any of the stakeholders in the process.
Lee and Colley (1990) developed a hierarchical review framework. At the top of the hierarchy is a comprehensive mark (A = well-performed and complete, through to F = very unsatisfactory) for the entire report. This mark is based on marks given to four broad sub-headings: description of the development, local environment and baseline conditions; identification and evaluation of key impacts; alternatives and mitigation of impacts; and communication of results. Each of these, in turn, is based on two further layers of increasingly specific topics or questions. Lee and Colley's criteria have been used either directly or in a modified form (e.g. by the IEMAJ to review a range of EJSs in the UK. Appendix 4 gives the Lee and Colley framework.
The European Commission has also published review criteria (CEC 2001). These are similar to Lee and Colley's, but use seven sub-headings instead of four, include a longer list of specific questions, and judge the information based on relevance to the project context and importance for decision- making as well as presence/absence in the EIS. The review criteria given in Appendix 4 are an
Table 6.5 Examples of possible uses for EIS review criteria

(a)

Criterion
Presence/absence (page number)
Information
Key information absent

Describes the proposed development, including its design, and size or scale
(p. 5)
Location (in plans), existing operations,
Working method, vehicle movements, restoration plans

access

Indicates the physical presence of the development
X

Srte buildings (location, size). restoration

(b) Simple grading for each criterion

Criterion	Presence/ absence (page number)	Comments	Grade
Explains the purposes and objectives of the development	(p. 11)	Briefiy in introduction, more details in Sec. 2	A
Gives the estimated duration of construction etc. phases	(p. 12)	Not decommissioning	B

Criterion Relevant? (Y/N) Judgement (C/A/1)" Comment
Considers the 'no action' alternative, y A alternative processes, etc.

If unexpectedly severe adverse N impacts are identified. alternatives are reappraised

Alternative sites discussed. but not alternative processes
Impacts of sand/gravel working well understood

C = complete; A = adequate; I = inadequate

amalgamation and extension of Lee and Colley's and the EC's criteria, developed by the Impacts Assessment Unit at Oxford Brookes University. Rodriguez-Bachiller with Glasson (2004) have also devised an expert system approach to EIS review. It is unlikely that any EIS will fulfil all the criteria. Similarly, some criteria may not apply to all projects. However, they should act as a checklist ofgood practice for both those preparing and those reviewing EISs. Table 6.5 shows a number of possible ways of using these criteria. Example (a), which relates to minimum requirements, amplifies the presence or otherwise of key information. Example (b) includes a simple grading, which could be on the A-F scale used by Lee and Colley, for each criterion (only one of which is shown here). Example (c) takes the format of the EC criteria, which appraise the relevance of the information and then judge whether it is complete, adequate (not complete but need not prevent decision-

making from proceeding) or inadequate for decision-making.
Where a local planning authority believes that an EIS does not provide the information they require to allow them to give full consideration of the proposed development's likely environmental effects, it must require the developer to provide further information. Any further information must be publicized and consulted on again.4

Decisions to authorize or reject projects arc made at several levels:
At the top of the tree are the relevant Secretaries of State ... ; below them are a host of Inspectors, sometimes called Reporters (Scotland); further down the list come Councillors, the elected members of district, county, unitary or metropolitan borough councils; and at the very bottom are chief or senior planning officers who deal with 'delegated decisions' ... las! a rough guide, the larger the project the higher up the pyramid of decision makers the decision is made. (Weston 1997)
Different decision-making rules apply for different UK jurisdictions. For instance, the Town and Country Planning Act 1990 (and parallel legislation in Scotland) requires planning decisions to be made with 'regard to the provisions of the development plan, so far as material to the application, and to any other material considera- tions'. There is no definitive list of material planning considerations, but they commonly include visual amenity, noise, traffic generation, nature conservation and other topics covered by EIA. This is expected to change under the proposed National Planning Policy Framework that would, instead, introduce a 'presumption in favour of sustainable development', namely that:
individuals and businesses have the right to build homes and other local buildings provided that they conform to national envir- onmental, architectural, economic and social standards, conform with the local plan, and pay a tariff that compensates the community for loss of amenity and costs of additional infrastructure. (Parliament 2011)
When determining an application for a nationally significant infrastructure project, the Infrastructure Planning Commission must have regard to any local impact report, other prescribed matters, and other matters that the !PC thinks are important and relevant to the decision; and it must decide the application in accordance with any relevant national policy statements unless, inter alia, the adverse impacts of the proposed develop- ment would outweigh its benefits (Planning Act 2008). However, in all cases, where a project requires EIA, the decision-maker must take into account the 'environmental information' in the decision. This is the information contained in the EIS and other documents, and any comment made by the statutory consultees and representations from members of the public.
The decision on an application with an EIS must be made within a specified period (e.g. 16 weeks for a local authority planning application), unless the developer agrees to a longer period. By any standards, making decisions on development projects is a complex undertaking. Decisions for projects requiring EIAs tend to be even more complex, because by definition they deal with larger, more complex projects, and probably a greater range of interest groups:
The competition of interests is not simply between the developer and the consultees. It can also be a conflict between consultees, with the developer stuck in the middle hardly able to satisfy all parties and the 'competent authority' left to establish a planning balance where no such balance can be struck. (Weston 1997)

Whereas the decision-making process for projects with £IA was initially accepted as being basically a black box, attempts have subsequently been made to make the process more rigorous and transparent. Research by the University of Manchester (Wood and Jones 1997) and Oxford Brookes University (Weston et al. 1997) have focused on how environmental information is used in UK decision-making; this is discussed further in Chapter 8. A government good practice guide on the evaluation of environmental informa- tion for planning projects (DoE 1994) begins with a definition of evaluation:
... in the context of environmental assess- ment, there are a number of different stages or levels of evaluation. These are concerned with:
checking the adequacy of the information supplied as part of the ES, or contributed from other sources;
examining the magnitude, importance and significance of individual environ- mental impacts and their effects on specific areas of concern ... ;
preparing an overall 'weighing' of envir- onmental and other material consider- ations in order to arrive at a basis for the planning decision.
The guide suggests that, after vetting the application and EIS, advertising the proposals and EIS, and relevant consultation, the planning authority should carry out two stages of decision-making: an evaluation of the individual environ- mental impacts and their effects, and weighing the information to reach a decision. The evaluation of impacts and effects first involves

verifying any factual statements in the EIS, perhaps by highlighting any statements of concern and discussing these with the developer. The nature and character of particular impacts can then be examined; either the EIS will already have provided such an analysis (e.g. in the form of Table 6.4) or the case-work officer could prepare such a table. Finally, the significance and importance of the impacts can be weighed up, taking into consider- ation such issues as the extent of the area affected, the scale and probability of the effects, the scope for mitigation and the importance of the issue.

The range of decision options are as for any application for project authorization: the compe- tent authority can grant permission for the project (with or without conditions) or refuse permission. It can also suggest further mitigation measures following consultations, and may seek to negotiate these with the developer. If the development is refused, the developer can appeal against the decision. If the development is permitted, indivi- duals or organizations can challenge the permis- sion. The relevant Secretary of State may also be able to 'call in' an application, for a variety of reasons. A public inquiry may result.

But decision-making is not a clinical exercise. Decision letters have been described as 'a letter to the loser' (Des Rosiers 2000), suggesting a type of personal relationship between decision-maker and decision-receiver. In a Canadian context, Ross (2000) explains how he and fellow panel member Mike Fanchuk wrote the report that explained their decision about whether to permit a pulp mill:

Mike Fanchuk [is] a farmer from just north of the pulp mill site ... During my work with Mike, we discussed when we would be satisfied with the report, and thus when we would be willing to sign it ... I believe Mike's approach is the best I have ever encountered. He would only be willing to sign the report when he felt that, in future years, he would be pleased to tell his eight-year old grand- daughter that he had served on the panel and authored the report. In academic terms, this intergenerational equity illustrates very well the principles of sustainable development ... More importantly, however, it illustrates the basic human need to be proud of work one has done.

An initial decision may need to be ratified by others, and may be overturned at that stage. In the case of a planning application, the planning officer's recommendations will go to the planning committee, which makes the final decision. In the UK, the !PC's decision will be passed to the relevant Secretary of State. Other procedures will apply to other jurisdictions.

A Secretary of State may 'call in' a planning application if a developer challenges a refusal of planning permission, a planning decision is not reached within a given time limit, or if the Secretary of State wants to consider the application for other reasons. A public inquiry must then be held if the developer or local planning authority requests one. At the inquiry, various parties can provide evidence and may be able to cross-question other parties. Public inquiries are expensive to all parties, and can be very drawn out. For instance, the public inquiry for Heathrow Terminal S lasted nearly four years. Weston (1997) compellingly discusses why all parties involved in EIA try to avoid public inquiries:

By the time a project becomes the subject of a public inquiry the sides arc drawn and the hearing becomes a focus for adversarial debate between opposing, expensive, experts directed and spurred on by advocates schooled in the art of cajoling witnesses into submission and contradictions. Such debates are seldom rational or in any other way related to the systematic, iterative and cooperative characteristics of good practice EIA. By the time the inquiry comes around, and all the investment has been made in expert witnesses and smooth talking barris- ters, it is far too late for all that.

Nevertheless, hundreds of projects involving EIA have gone to inquiry.

rhe environmental impact of proposals, especially traffic, landscape and amenity issues, will certainly be examined in detail during any inquiry. The EIA regulations allow inquiry inspectors and the Secretary of State to require (a) the submission of an EIS before a public inquiry, if they regard this as appropriate, and (b) further information from the developer, if they consider the EIS is inadequate as it stands. In practice, before public inquiries involving EIAs the inspec- tor generally receives a case file, including the EIS, which is examined to determine whether any further information is required. Pre-inquiry meet- ings may be held where the inspector may seek further information. These meetings may also assist the developer and competent authority to arrive at a list of agreed matters before the start of the inquiry; this can avoid unnecessary delays during it. At the inquiry, inspectors often ask for further information, and they may adjourn the inquiry if the information cannot be produced within the available time. The information contained in the EIS will be among the material considerations taken into account. However, an inadequate EIS is not a valid reason for preventing authorization, or even for delaying an inquiry.5

An analysis of ten public inquiries involving projects for which EISs had been prepared Oones and Wood 1995) suggested that in their recom- mendations most inspectors give 'moderate' or 'considerable' weight to the EIS and consultations on the EIS, and that environmental information is of 'reasonable' importance to the decision whether to grant consent. However, a subsequent study of 54 decision letters from inspectors (Weston 1997) suggested that EIA has had little influence on the inquiry process: in about two- thirds of the cases, national or local land-use policies were the determining issues identified by the inspectors and the Secretary of State, and in the remaining cases other traditional planning matters predominated:

The headings which dominate the decision letters of the Inspectors and Secretaries of State arc the traditional planning material considerations such as amenity, various forms of risk, traffic and need, although some factors such as flora and fauna, noise and landscape do tend to be discussed separately. (Weston 1997)

review

The UK planning system has no official provisions for an appeal against development consent. However, if permission is granted, a third party may challenge that decision through judicial review proceedings in the UK courts, or through the European Commission.

In the UK, an application for judicial review of a decision should be made promptly, typically within 6 weeks or 3 months of the decision (depending on the type of decision). Judicial review proceedings first require that the third party shows it has 'standing' to bring in the application, namely sufficient interest in the project by virtue of attributes specific to it or circumstances, which differentiate it from all other parties (e.g. a financial or health interest). Establishing standing is one of the main difficulties in applying for judicial review.6 If standing is established, the third party must then convince the court that the competent authority did not act according to the relevant EIA procedures. The court does not make its own decision about the merits of the case, but only reviews the way in which the competent authority arrived at its decision:

l'he court will only quash a decision of the [competent authority] where it acted without jurisdiction or exceeded its jurisdiction or failed to com ply with the rules of natural justice in a case where those rules apply or where there is an error of law on the face of the record or the decision is so unreasonable that no [competent authority] could have made it. (Atkinson and Ainsworth 1992)

Various possible scenarios emerge. A competent authority may fail to require an EIA for project that should have had one; a planning officer without formal delegated authority may make a planning decision; a planning authority may make a planning decision without having access to, or having adequately considered, all relevant environmental information. In such a case, its decision would be void. Several court cases have also revolved around the level of detail needed in EISs of outline planning applications. Section 8.6 discusses these in more detail. Although recent UK court cases have interpreted the requirements of the EIA Directive as having a 'wide scope and broad purpose', it is very unlikely that the UK courts will ever play as active a role as those in the US did in relation to the NEPA.

Another avenue by which third parties can challenge a competent authority's decision to permit development, or not to require EIA, is the European Commission. Such cases need to show that the UK failed to fulfil its obligations as a Member State under the Treaty of Rome by not properly implementing EC legislation, in this case Directive 85/337. In such a case, Article 169 of the Treaty allows a declaration of non-compliance to be sought from the European Court of Justice. The issue of standing is not a problem here, since the European Commission can begin proceedings either on its own initiative or based on the written complaint of any person. To use this mechanism, the Commission must first state its case to the Member State and seek its observations. The Com- mission may then issue a 'reasoned opinion'. If the Member State fails to comply within the specified time, the case proceeds to the European Court of Justice.

Under Article 171 of the Treaty of Rome, if the European Court of Justice finds that a Member State has failed to fulfil an obligation under the Treaty, it may require the Member State to take the neces- sary measures to comply with the Court's judge- ment. Under Article 186, the EC may take interim measures to require a Member State to desist from certain actions until a decision is taken on the main action. However, to do so the Commission must show the need for urgent relief, and that irreparable damage to community interests would result if these measures were not taken. Readers are referred to Atkinson and Ainsworth (1992), Buxton (1992) and Salter (1992a, b, c) for further information on procedures.

Of the environmental infringement cases handled by the European Commission, about 10 per cent relate to environmental impact assessment. The largest number of environmental infringements in

2008 and 2009 were against Italy, Spain, Ireland, France and the UK (EC 2010b).

Active public participation, thorough consultation with relevant consultees and good presentation are important aspects of a successful EIA pro- cess. All have been undervalued to date, despite the transposition of the Aarhus Convention. The presentation of environmental information has improved, and statutory consultees are becoming increasingly familiar with the EIA process, but public participation is likely to remain a weak aspect of EIA until developers and competent authorities see the benefits exceeding the costs.

Formal reviews of EIAs are also rarely carried out, despite the availability of several non-mandatory review guidelines and government advice on the use of environmental information in decision- making. Such reviews can help to ensure that the EIS is fully taken into consideration in the decision- making stage. The links between the quality of an EIS and that of the planning decision are discussed in Chapter 8.

Several appeals against development consents or against competent authorities' failure to require EIA have been brought to the UK courts or the EC. The UK courts have historically taken a relatively narrow interpretation of the requirements of the EIA regulations, but this has recently been changing. The EC, by contrast, has challenged the UK government on its implementation of Directive 85/337 and on a number of specific decisions resulting from this implementation.

More positively, the next step in a good EIA procedure is the monitoring of the development's actual impacts and the comparison of actual and predicted impacts. This is discussed in the next chapter.

SOME QUESTIONS

The followi11g questions are intended to help the reader focus 011 the key ismes of' this chapter.

1. Public participation and public consultation are often used synonymously. What is the difference between them?

2. Different stakeholders require different techniques to learn about a project's environmental impacts and provide optimum input to the project planning process. Assume that you are devising a public participation programme for a wind farm EIS (or a different kind of project with which you are familiar). Using Table 6.3 as a basis, which three techniques would you use for local residents? Which three would you use for a national-level non-governmental organization opposed to wind power on landscape grounds? Which three would you use for the government agency responsible for biodiversity? (NB: some of them might be the same from group to group).

3. The introductory section to the EIA Directive refers to public participation in the following way: 'Whereas development consent for public and private projects ... should be granted only after prior assessment ... ; whereas this assessment must be conducted on the basis of the appropriate information supplied by the developer, which may be supplemented by the authorities and by the people who may be concerned by the project in question.' How might it be rephrased to promote a higher level of public participation in EIA?

4. Section 6.2.3 lists the UK procedural requirements for public participation. Do they match the level of participation set out in the introductory section to the EIA Directive (see question 3 above)?

5. For a country and type of plan of your choice, identify the statutory consultees.

6. In one page, explain the EIA process in a non-technical way.

7. Explain what is wrong with the 'wrong' quotes in Section 6.4.2. Try to rephrase them in a 'right' way.

8.

Figure 6.2 shows different ways of presenting an EIS. Which do you think would work best for: (i) technically minded consultees; (ii) people with access to the Internet, and those without access; (iii) people who have problems reading small print (or at all); (iv) people who might struggle to pay for the 'reasonable cost' of printing and distributing the EIS?

9
Under what circumstances might each of the grading approaches (a-c) in Table 6.5 be used?

Notes

Although this section refers to public consullation and participation together as 'public participation', the two are in fact separate. Consultation is in essence an exercise concerning a passive audience: views are solicited, but respondents have little active influence over any resulting decisions. In contrast, public participation involves an active role for the public, with some influence over any modifications to the project and over the ultimate decision.

2
The coalition government of 2010 will change this,

although details are not yet available at the time of writing (spring 2011). The IPC and the Planning Inspectorate will be merged, and the IPC will make recommendations to the relevant secretary of stale, who will make the final decision.

3
Weston (1997) notes that LPAs need to be aware that they have the power to ask for further information, and that failure to use it could later be seen as tacit acceptance of the information provided. For instance, when deciding on an appeal for a Scottish quarry extension, the Reporter noted that it was significant that the LPA had not requested further information when they were processing the application, and had not objected to the EIS until the development came to appeal.

4
Where the project has already been built without authorization, the competent authority considers the environmental information when determining whether the project will be demolished or not.

5
For instance, in the case of a Scottish appeal regarding a proposed quarry extension (Scottish 0 ffice, P/PPA/SQ/336, 6 January 199 2), the Reporter noted that: 'The ES has been strongly

criticised ... [it] does not demonstrate that a proper analysis of environmental impacts has been made ... Despite its shortcomings, the ES appears to me to comply broadly with the statutory requirements of the EA regulations.'

6
An EC court case, for instance, ruled that Greenpeace had insufficient individual concerns to contest a decision to use regional funds to help build power stations in the Canary Islands (Greenpeace vs. Commission of the European Communities,

Journal of Environmental Law, 8 (1996), 139). Similar judgements have been made in the UK context. COWi (2009) provides further information on standing in different Member States.

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7 Monitoring and auditing: after the decision

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Major projects, such as roads, airports, power stations, waste processing plants, mineral develop- ments and holiday villages, have a life cycle with a number of key stages (see Figure 1.5). The life cycle may cover a very long period (e.g. 50-60 years for the planning, construction, operation and decommissioning of a fossil-fuelled power station). Eli\, as it is currently practised in the UK and in many other countries, relates primarily to the period before the decision. At its worst, it is a partial linear exercise related to one site, produced in-house by a developer, without any public participation. There has been a danger of a short-sighted 'build it and forget it' approach (Culhane 1993). llowever, EIA should not stop at the decision. It should be more than an auxiliary to the procedures to obtain a planning permission; rather it should be a means to obtain good environmental management over the life of the project. This means including monitoring and auditing fully into the ElA process. There is a continuing danger that emphasis on pre-decision analysis will keep ElA away from its key goal of environmental protection. EIA should seek to
maximize the potential for continuous improve- ment. Resources spent on baseline studies and predictions may be rendered of little value unless there is some way of testing the predictions and determining whether mitigation and enhancement measures are appropriately applied (Ahammed and Nixon 2006). It is good to record that there is now more learning from experience and some good progress to note; sec for example Morrison- Saunders and Arts (2004) and the special edition of the impact Assr:ss111c11t a11d Project Appraisal journal (IAPAY 2005) on EIA follow-Up.

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In many aspects of EIA there has been consid- erable semantic development and a widening of relevant terms. In earlier editions of this chapter we have focused primarily on mo11itori11s and auditins as key elements in the after the decision process, or the follow- up process as it is known in some countries such as Canada and Australia. These elements are still crucial and the main focus of Chapter 7, but note should also be taken of a widening of those key elements to also include management and com1111111ications (Arts et al. 2001; Marshall et al. 2005). In total such elements can facilitate learning from experience, preventing EIA from becoming just a pro-forma exercise with little clout after the project decision has been taken.

Mo11itori11s involves the measuring and recording of physical, social and economic variables associ- ated with development impacts (e.g. traffic flows, air quality, noise, employment levels). The activity seeks to provide information on the characteristics and functioning of variables in time and space, and in particular on the occurrence and magnitude of impacts. Monitoring can improve project man- agement. It can be used, for example, as an early warning system, to identify harmful trends in a locality before it is too late to take remedial action. It can help to identify and correct unanticipated impacts. Monitoring can also provide an accepted database, which can be useful in mediation between interested parties. Thus, monitoring of the origins, pathways and destinations of, for example, dust in an industrial area may clarify where the responsibilities lie. Monitoring is also essential for successful environmental impact auditing, and can be one of the most effective guarantees of commit- ment to undertakings and to mitigation and enhancement measures.

E11viro11111e11tal impact auditing, which is covered
in this chapter, involves comparing the impacts predicted in an EIS with those that actually occur after implementation, in order to assess whether the impact prediction performs satisfactorily (Buckley 1991). In some of the literature this step is sometimes referred to as evaluation. The audit can be of both impact predictions (how good
were the predictions?) and of mitigation and enhancement measures and conditions attached to the development (are the mitigation and enhance- ment measures effective; are the conditions being honoured?). This approach to auditing contrasts with e11viron111e11tal management auditing, which focuses on public and private corporate structures and programmes for environmental management and the associated risks and liabilities. We discuss this latter approach further in Chapter 12.

Management is an important element in terms of making decisions and taking appropriate action in response to issues raised from the monitoring and auditing activities (Marshall et al. 2005). For example, monitoring may show lower levels of local recruitment than predicted for the con- struction stage of a major project. A management response may be to redouble efforts on local training programmes. Com1111111icatio11 is to inform stakeholders about the results of EIA monitoring, auditing and management activities. Such com- munication may emanate from both proponents and regulators; hopefully there may be a partner- ship approach between the two. Ideally the com- munity stakeholder's role is more than that of passive recipient of follow-up activities, and rather more one of partner in the process, being involved directly in the follow-up activities.

In total, such activities can make important contributions to the better planning and EIA of future projects (Figure 7.1). There is a vital need to introduce feedback in order to learn from experi- ence; we must avoid the constant 'reinventing of the wheel' in EIA (Sadler 1988). Monitoring and auditing of outcomes, and the resultant manage- ment responses and associated communication, can contribute to an improvement in all aspects of the EIA process, from understanding baseline conditions to the framing of effective mitigating and enhancement measures. In addition, Greene et al. (1985) noted that monitoring and auditing should reduce time and resource commitments to EIA by allowing all participants to learn from past experience; they should also contribute to a general enhancing of the credibility of proponents, regulatory agencies and EIA processes. We are learning, and there is a considerable growth of interest in examining the effectiveness of the EIA process in practice. However, there are still a number of significant issues that have limited the

Audtl
Pt0l ct B

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Figure 7.1
Time .

Monitoring, auditing and learning from experience in the EIA process
Source: Adapted from Bisset and Tomlinson 1988; Sadler 1988

use of monitoring and auditing to date. These issues and possible ways forward for monitoring and auditing in practice are now discussed.

Monitoring implies the systematic collection of a potentially large quantity of information over a long period of time. Such information should include not only the traditional indicators (e.g. ambient air quality, noise levels, the size of a work- force) but also causal underlying factors (e.g. the decisions and policies of the local authority and developer). The causal factors determine the

impacts and may have to be changed if there is a wish to modify impacts. Opinions about impacts arc also important. Individual and group 'social constructions of reality' (IOCGP 2003) are

often sidelined as 'mere perceptions, or emotions', not to be weighted as heavily as facts. But such opinions can be very influential in determining the response to a project. To ignore or undervalue them may not be methodologically defensible and is likely to raise hostility.
Monitoring should also analyse impact equity. The distribution of impacts will vary between groups and locations; some groups may be more vulnerable than others, as a result of factors such as age, race, gender and income. So a systematic attempt to identify opinions can be an important input into a monitoring study.
The information collected needs to be stored, analysed and communicated to relevant partici- pants in the EIA process. A primary requirement, therefore, is to focus monitoring activity only on 'those environmental parameters expected to experience a significant impact, together with those parameters for which the assessment methodology or basic data were not so well established as desired' (Lee and Wood 1980).
Monitoring is an integral part of EIA; baseline data, project descriptions, impact predictions and mitigation and enhancement measures should be developed with monitoring implications in mind. An EIS should include a monitoring programme that has clear objectives, temporal and spatial controls, an adequate duration (e.g. covering the main stages of the project's implementation), practical methodologies, sufficient funding, clear responsi- bilities and open and regular reporting. Ideally, the monitoring activity should include a partner- ship between the parties involved; for example, the collection of information could involve the developer, local authority and local community. Monitoring programmes should also be adapted to the dynamic nature of the environment (Holling 1978).

Unfortunately, monitoring is not a mandatory step in many EIA procedures, including those current in the UK. In contrast to the more recent SEA regulations, European Commission EIA regulations do not specifically require monitoring. This omission was recognized in the review of Directive 85/337 (CEC 1993). The Commission is a strong advocate for the inclusion of a formal monitoring programme in an EIS, but EU Member States are normally more defensive and reactive. In conse- quence, the amended Directive docs not include a mandatory monitoring requirement.1 How- ever, this has not deterred some Member States. For example, in The Netherlands the competent authority is required to monitor project implemen- tation, based on information provided by the developer, and to make the monitoring informa- tion publicly available. If actual impacts exceed those predicted, the competent authority must take measures to reduce or mitigate these impacts.
However, despite such legal provisions, practice has been limited and little post-EIA monitoring and evaluation has been carried out. See Arts (1998) for a comprehensive coverage of ElA follow-up in The Netherlands.
In other Member States, as noted in Chapter 2 and CEC (2009), the lack of a mandatory moni- toring requirement is a continuing, serious and long-standing issue. In the absence of mandatory procedures, it is usually difficult to persuade developers that it is in their interest to have a continuing approach to EIA. This is particularly the case where the proponent has a one-off project, and has less interest in learning from experience for application to future projects. Fortunately, we can turn to some examples of good practice in a few other countries. A brief summary of monitor- ing procedures in Canada is included in Chapter
10. In Western Australia (also see Chapter 10), the environmental consequences of developments are commonly monitored and reported. If it is shown that conditions are not being met, the government may take appropriate action. Interestingly, there is provision in Western Australian procedures for an 'environmental review and management programme' (Morrison-Saunders 1996).

The information collected needs to be stored, analysed and communicated to relevant partici- pants

these can include, for example, 'stop work' orders, • fines and restitution. The components of a moni- toring programme would normally include the • following:

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a summary of the significant impacts identi- fied in the environmental impact report (ElR); •

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the mitigation measures recommended for each significant impact;

the person or agency responsible for the moni- toring of the mitigation measure;
the timing and/or frequency of the moni- toring;
the agency responsible for ensuring compli- ance with the monitoring programme; and the reporting requirements.

Figure 7.2 provides an extract from a monitoring

- the monitoring requirements, and responsible agency(ies), for each mitigation measure;

programme for a woodwaste conversion facility at West Berkeley in California.

Responsible Party for Mitigation
and/or Monitoring Frequency

Agency Responsible for Retaining Monitoring Forms

In Hong Kong, a systematic, comprehensive environmental monitoring and auditing system was introduced in 1990 for major projects. A major impetus for action was the construction of the new $20 billion airport at Chap Lap Kok, which included the construction of not only the airport island, but also a railway, highways and crossings and a major Kowloon reclamation project. The Environmental Monitoring and Audit (EM&A) manual includes three stages of an event action plan: (1) trigger level, to provide an early warn- ing; (2) action level, at which action is to be taken before an upper limit of impacts is reached; and
(3)
target level, beyond which a predetermined plan response is initiated to avoid or rectify any problems. The approach does build monitoring much more into project decision-making, requir- ing proponents to agree monitoring and audit protocols and event action plans in advance; how- ever, enforcement has been problematic (Au and Sanvicens 1996). The EM&A is intended to be a dynamic document to be reviewed regularly and updated (as necessary) during the implementation of the project.

Since April 1998 there have been EIA regulations in force that stipulate in detail when and how environmental monitoring and auditing should be done (EPD 1997, 1998). The regulations nor- mally result in permit conditions relating to project approval. This has provided a statutory basis for follow-up work, and offences carry stiff penalties (up to $250,000 and six months imprisonment). A recent and fascinating innovation in the Hong Kong system is the use of the Internet for moni- toring the effects of large projects and of com- pliance with the permit conditions. Under pro- cedures introduced since 2000 major projects must set up a monitoring website (see www.info. gov.hk/epd/eia). Some sites include webcams focused on parts of the project. There is public access to the websites, and concerned members of the public can report their views on project performance back to both the government and the developer (Hui and Ho 2002). ls this the shape of things to come? rable 7.1 provides an extract from an EM&A report for a Hong Kong helipad development.

The case

Table 7 .1 Extract from an EM&A report for a helipad project in Hong Kong: implementation schedule of recommended mitigation measures for construction of Yung Shue Wan Helipad (air quality mitigation measures)
EIA Ref. EM&A Ref. Recommended Objectives of the Who to Location/timing What requirements or environmental recommended implement the of implementation standards for the protection/mitigation measures and measure? measures measure to achieve? measures main concerns to
address

S3.5.1 S2.5 All dust control Air quality during Contractors At all construction EIAO-TM, Air Pollution measures as construction works sites through Control {Construction recommended in the duration of Dust) Regulations
Air Pollution Control construction works
Regulation, where applicable, should be implemented
S3.5.1 S24 Typical dust control Air quality during Contractors At all construction EIAO-TM, Air Pollution measures include: construction works sites through Control {Construction

•
 restricting heights duration of Dust) Regulations
7.4
 Auditing in practice

from which materials construction works
are dropped, as far as practicable, to minimize the fugitive dust arising from loading/unloading
S3.51 S24 • all stockpiles of Air quality during Contractors At all construction EIAO-TM, Air Pollution excavated materials or construction works sites through Control {Construction
spoil of more than 50m3 duration of Dust) Regulations
should be enclosed, construction works
covered or dampened during dry or windy conditions
S3.5.1 S2.4 • effective waler sprays Air quality during
should be used to control construction potential dust emission
sources such as unpaved haul roads and active construction areas
Contractors At all construction
works sites through duration of construction works
EIAO-TM, Air Pollution Control {Construction Dust) Regulations

Source: CWE-ZHEC Joint Venture 2007

understate, on average by about 30 per cent, the amount of monitoring actually undertaken. This may be a response to planning conditions and agreements resulting from the decision-making process; it may also relate to other relevant licensing procedures, such as IPC. Whatever the case, the findings do suggest that some monitoring proposals in EISsare carried out and are often more extensive than the, admittedly often limited, coverage in E!As. The findings do not, of course, provide any

Auditing has developed a considerable variety of types. Tomlinson and Atkinson (1987a, b) attempted to standardize definitions with a set of terms for seven different points of audit in the 'standard' EIA process, as follows:
information on the quality of the monitoring or • about the accuracy of the predictions.
Decision point audit (draft EIS): by regulatory authority in the planning approval process.

Table 7.2 Types of impact monitoring in UK EISs Table 7.3 Problems associated with post-auditing studies

Type % of total monitoring proposals

Nature of impact predictions
Water quality Air emissions
Aqueous emissions Noise
General Others Ecological Archaeological Air quality
Structural survey Liaison group Water levels

Source: Glasson 1994

16
15
13
12

g
7
7
6
5
4
3
3
100
Many EISs contain few testable predictions; instead, they simply identify issues of potential concern.
Many EIS predictions are vague, imprecise and qualitative.
Testable predictions often relate to relatively minor impacts, with major impacts being referred to only in qualitative terms.
Project medifications
Post-EIS project modifications invalidate many predictions.

Monitoring data
Monitoring data and techniques often prove inadequate for auditing purposes.
Pre-development baseline monitoring is often insufficient, if undertaken at all.
Most monitoring data are collected and provided by the project proponent, which may give rise to fears of possible bias in the provision of information.

- Decision point audit (final EIS): also by

regulatory authority in the planning approval process.
Implementation audit: to cover start-up; it could include scrutiny by the government and the public and focus on the proponent's com- pliance with mitigation and other imposed conditions.

- Performance audit: to cover full operation; it could also include government and public scrutiny.

- Predictive techniques audit: to compare actual with predicted impacts as a means of comparing the value of different predictive techniques.

- Project impact audits: also to compare actual with predicted impacts and to provide feed- back for improving project management and for future projects.

- Procedures audit: external review (e.g. by the public) of the procedures used by the govern- ment and industry during the EIA processes.

7.5 A UK case study: monitoring and auditing the local socio-economic impacts of the Sizewell B PWR construction project

These terms can and do overlap. The focus here is on project, performance and implementation audits. Whatever the focus, auditing faces a num- ber of major problems as outlined in Table 7.3.
Such problems may partly explain the dismal record of the early set of Canadian EISs examined, from an ecological perspective, by Beanlands and Duinker (1983), for which accurate predictions appeared to be the exception rather than the rule.

Comprehensiveness
Many auditing studies are concerned only with certain types of impacts (e.g. biophysical but not socio-economic; operational but not construction-stage impacts) and are therefore not full-project EIA audits.
Clarity
Few published auditing studies are explicit about the criteria used to establish prediction

accuracy; this lack of clarity hampers comparisons between different studies.
Interpretation
Most auditing studies pay little attention to examining the underlying causes of predictive errors: this needs to be addressed if monitoring and auditing work is to provide an effective feedback in the EIA process.

Source: Chadwick and GlassonI 999

There are several examples, also from Canada, of situations where an EIA has failed to predict significant impacts. Berkes (1988) indicated how an EIA on the James Bay mega-HEP (1971-85) failed to pick up a sequence of interlinked impacts, which resulted in a significant increase in the mercury contamination of fish and in the mercury poisoning of native people. Dickman (1991) identified the failings of an EIA to pick up the impacts of increased lead and zinc mine tailings on the fish population in Garrow Lake, Canada's most northerly hypersaline lake. Such outcomes are not unique to Canada, which is a leader in monitoring; hopefully the incidence of such
research is leading to improved and better predictions.
Findings from the early limited auditing activity in the UK were also not too encouraging . A study of four major developments - the Sullom Voe (Shetlands) and Flotta (Orkneys) oil terminals, the Cow Green reservoir and the Redcar steelworks - suggested that 88 per cent of the predictions were not auditable. Of those that were auditable, fewer than half were accurate (Bisset 1984). Mills's (1992) monitoring study of the visual impacts of five 1990s UK major project developments (a trunk road, two wind farms, a power station and an opencast coal mine) revealed that there were often significant differences between what was stated in an EIS and what actually happened. Project descriptions changed fundamentally in some cases, landscape descriptions were restricted to land immediately surrounding the site and aes- thetic considerations were often omitted. However, mitigation measures were generally carried out well.
Other early examples of auditing included the Toyota plant study (Ecotech Research and Consulting Ltd 1994), and various wind farm studies (Blandford, C. Associates 1994; ETSU 1994). The Toyota study took a wide perspective on environmental impacts; auditing revealed some underestimation of the impacts of employment and emissions, some overestimation of housing impacts and a reasonable identification of the impacts of construction traffic. The study by Blandford, C. Associates of the construction stage of three wind farms in Wales confirmed the predictions of low ecological impacts, but suggested that the visual impacts were greater than predicted,
with visibility distance greater than the predicted 15 km. However, the latter finding related to a winter audit; visibility may be less in the haze of summer.
One of the most comprehensive nationwide auditing studies of the precision and accuracy of environmental impact predictions was carried out by Buckley (1991) in Australia. At the time of his study, he found that adequate monitoring data to test predictions were available for only 3 per cent of the up to 1,000 EISs produced between 1974 and 1982. In general, he found that testable predictions and monitoring data were available only for large, complex projects, which had often been the subject of public controversy, and whose monitoring was aimed primarily at testing compliance with standards rather than with impact predictions. Some examples of over 300 major and subsidiary predictions tested are illustrated in Table 7.4. Overall, Buckley found the average accuracy of quantified, critical, testable predictions was 44 ± S per cent standard error. The more severe the impact, the lower the accuracy. Inaccuracy was highest for predictions of groundwater seepage. Accuracy assessments are of course influenced by the degree of precision applied to a prediction in the first place. In this respect, the use of ranges, reflecting the probabilistic nature of many impact predictions, may be a sensible way forward and would certainly make compliance monitoring more straightforward and less subject to dispute.
Buckley's national survey, showing less than SO per cent accuracy, provided no grounds for compla- cency. Indeed, as it was based on monitoring data provided by the operating corporations concerned, it may present a better result than would be

Table 7.4 Examples of auditing of environmental impact predictions

Component/parameter
Type
Predicted
Ac1ual
Accuracy/

Surface water
Bauxite mine
No detectable increase
None detected
Correct

qualify: salts, pH

in stream salinity

Noise
Bauxite mine
Blast noise <115dBA
Only 90 per cent
<115dBA
Incorrect: 90 per cent accurate, worse

Workforce
Aluminium smelter
1,500during construction
Upto 2,500
Incorrect: 60 per cent accurate, worse

Source: Buckley 1991

generated from a wider trawl of E!Ss. On the other hand, we are learning from experience, and more recent EISs may contain better and more accurate predictions. Marshall (2001) reviewed a set of 1,118 mitigation proposals from 41 E!Ss in the UK. He found that in 38 per cent of the cases (418 in total), the mitigation proposals were expressed in such a way that the proponent could not be held to be committed to their implementation. In such cases mitigation is of little value, and there may be major compliance issues.

There has not, until recently, been much emphasis on auditing studies on the important area of predictive techniques audit, and on the value of particular predictive techniques. Where there have been studies, they have tended to focus on identifying errors associated with predictive methods rather than on explaining the errors. There is a need to develop appropriate audit methodologies, and as more projects are imple- mented there should be more scope for such studies. The pioneering study by Wood on visi- bility, noise and air quality impacts, using GIS to audit and model EIA errors, provides an example of a way forward for such work (Wood 1999a, b, 2000).

7.5. 1 Background to the case study

Although monitoring and auditing impacts arc not mandatory in EIA procedures in the UK, the physical and socio-economic effects of develop- ments are not completely ignored. r-or example, a number of public agencies monitor particular pollutants. I.PAs monitor some of the conditions attached to development permissions. However, there is no systematic approach to the monitoring and auditing of impact predictions and mitigation measures. This case study reports on one early and still very topical attempt (in the context of a raft of proposals for many new energy projects in the
UK over the period to 2025) to introduce a more systematic, although still partial, approach to the subject.

In the 1970s and early 1980s, Britain had an active programme of nuclear power station construction. This included a commitment, revised in the 1990s (but now very much alive), to build a family of new nuclear plants (at the time they were PWR stations). The first such station to be approved was Sizewell B in East Anglia. The approval was controversial, and followed the longest public inquiry in UK history. Construction started in 1987, and the project was completed in 1995. The !AU in the School of Planning at Oxford Brookes University had studied the impacts of a number of power stations and made contributions to E!Ss, with a focus on the socio-economic im- pacts. A proposal was made to the relevant public utility, the Central Electricity Generating Board (CEGB), that the construction of Sizewell B provided an invaluable opportunity to monitor in detail the project construction stage, and to check on the predictions made at the public inquiry and on the mitigating conditions attached to the project's approval. Although the predictions were not formally packaged in an EIS, but rather as a series of reports based on the inquiry, the research was extensive and comprehensive (DOEn 1986). The CEGB supported a monitoring study, which began in 1988. To the credit of the utility, which became Nuclear Electric/British Energy, and latterly EDF (Electicite de France) following privatization, there was a continuing commitment to the monitoring study - despite the uncertainty about further nuclear power station developments in Britain. Monitoring reports for the whole construc- tion period and on the project's operation were completed (Glasson eta/. 1989-97; see also Glasson 2005 for further reflection on the project).

7.5.2 Operational characteristics of the monitoring study

It is important to clarify the objectives of the 111011itori11:,: study, otherwise irrelevant information may be collected and resources wasted. Figure 7.3 outlines the scope of the study. The development under consideration was the construction stage of the Sizewell B PWR 1,200 MW nuclear power station. The focus was on the socio-economic impacts of the development, although with some limited consideration of physical impacts. The socio-economic clement of ElA involves 'the systematic advanced appraisal of the impacts on the day to day quality of life of people and com- munities when the environment is affected by development or policy change' (Bowles 1981). This involves a consideration of the impacts on employment, social structure, expenditure, services, etc. Although socio-economic studies have often been the poor relation in impact assessment studies to date, meriting no more than a chapter or two in ElSs, they arc important, not least because they consider the impacts of developments on people, who can answer back and object to developments. The highest priority in the study was to identify the impacts of the development on local employ- ment; this emphasis reflected the pivotal role of employment impacts in the generation of other local impacts, particularly accommodation and local services. In addition to providing an updated and improved database to inform future assess- ments, assisting project management of the Sizcwcll B project in the local community and auditing impact predictions, the study also monitored and audited some of the conditions and undertakings associated with permission to proceed with the construction of the power station. These included undertakings on the use of rail and the routeing of road construction traffic, as well as conditions on the use of local labour and local firms, local liaison arrangements and (traffic) noise (DOEn 1986).

rhc monitoring study included the collection of a range of information, including statistical data (e.g. the mixture of local and non-local construction-stage workers, the housing tenure status and expenditure patterns of workers), decisions, opinions and perceptions of impacts. The spatial scope of the study extended to the commuting zone for construction workers (Figure 7.4). The study included information from the

Project/ locality

Sit4'W 8
PWP.

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Planning

Construction

Operation

Stage

Issue

Impacts

Figure 7.3
Developer recruitment policies

et'"

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Causal
factors
Scope of study and database organization: Sizewell B monitoring study
Source: Glasson el al. 1989-97

developer and the main contractors on site, from the relevant local authorities and other public agencies, from the local community and from the construction workers. The local upper-school geography A-level students helped to collect data on the local perceptions of impacts via biennial questionnaire surveys in the town of Leiston, which is adjacent to the project site. A major survey of the socio-economic characteristics and activities of a 20 per cent sample of the project workforce was also carried out every two years. The 1/\U team operated as the catalyst to bring the data together. rhere was a high level of support for the study, and the results were made openly available in published annual monitoring reports and in summary broadsheets, which were available free to the local community (Glasson et al. 1989-97). The study highlighted a number of methodo- logical difficulties with monitoring and auditing. The first relates to the disaggregation of project-related impacts from baseline trends. Data are available that indicate local trends in a number of variables, such as unemployment levels, traffic volumes and crime levels. But problems are encountered when we attempt to explain these local trends. To what extent are they due to (a) the construction project itself, (b) national and regional factors, or (c) other local changes independent of the construction project? It is straightforward to isolate the role of national and regional factors, but the relative roles of the construction project and other local changes are very difficult to determine. 'Controls' are used where possible to isolate the project-related

impacts.
A second problem related to the identification of the indirect, knock-on effects of a construction project. Indirect impacts - particularly on employ- ment - may well be significant, but they are not easily observed or measured. For example, indirect employment effects may result from the replace- ment of employees leaving local employment to take up work on site. Are these local recruits replaced by their previous employers? If so, do these replacements come from other local employ- ees, the local unemployed or in-migrant workers? It was not possible to obtain this sort of informa- tion. Further indirect employment impacts may stem from local businesses gaining work as suppliers or contractors at Sizewell B. They may need to take on additional labour to meet their
extra workload. The extent to which this has occurred is again difficult to estimate, although surveys of local companies have provided some useful information on these issues (Glasson and Heaney 1993).

7.5. 3 Some findings from the studies
A very brief summary of a number of the findings is outlined below and in Figure 7.5.

Employment
An important prediction and condition was that at least 50 per cent of construction employment should go to local people (within daily commuting distance of the site). This was the case, although, predictably in a rural area, local people have the largely semi-skilled or unskilled jobs. As the employment on site increased, with a shift from civil engineering to mechanical and electrical engineering trades, the pressure on maintaining the 50 per cent proportion increased. In 1989, a training centre was opened in the nearest local town, Leiston, to supply between 80 and 120 trainees from the local unemployed.

Local economy
A major project has an economic multiplier effect on a local economy. By the end of 1991, Sizewell B workers were spending about £500,000 per week in Suffolk and Norfolk, Nuclear Electric had placed orders worth over f.40 million with local com- panies and a 'good neighbour' policy was funding a range of community projects (including f.1.9 million for a swimming pool in Leiston).

Housing
A major project, with a large in-migrant workforce, can also distort the local housing market, and tourism accommodation in tourist industry locations. One mitigating measure at Sizewell B was the requirement of the developer to provide a large site hostel. A 600-bed hostel (subsequently increased to 900) was provided. It was very well used, accommodating in 1991 over 40 per cent of the in-migrants to the development, at an average occupancy rate of over 85 per cent, and it helped to reduce demand for accommodation in the locality.

0
10
20
30
40
50 Miles

0
10 20
30
40
50
60
70
80 Kilometres

D

Boundary of CDCZ Note: The areas within the Shaded Boundary are The Travel to Work areas which fall within
the CDCZ.
35 Mile Radius

Figure 7.4

Sizewell B commuting zone: monitoring study area

Source: Glasson et al. 1989-97

Figure 7.5

Brief summary of some findings from the Sizewell B PWR construction project monitoring and auditing study
Source: Glasson et al.
1989-97

Employment impacts

The Extent of Local Labour Recruitment

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Actual and Predicted Growth of the Construction Workforce
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Social impacts

Number of Local Arrests, 1987 and 1991

Drink driving arrests Pu bile order/drunkenness a nests
80-.

110

20

1987 1991 1987 1991

- Non-Sizcwcll B I I Sizcwnll B In-migrant I Siznwcll B local

Traffic Impacts

-Railway
..Traffic Monitoring Point

0

0 2 3 Miles

Increase in Traffic Flows Between 1988 and 1991

L
=

Monitoring Point on the Local Road Network
D 8 - 1991

Traffic and noise
The traffic generated by a large construction project can badly affect local towns and villages. To mitigate such impacts, there was a designated construction traffic route to Sizewell B. The monitoring of traffic flows on designated and non- designated (control) routes indicated that this mitigation measure was working. Between 1988 and 199 I, the amount of traffic rose substantially at the four monitoring points on the designated route, but much less so at most of the seven points not on that route. Construction noise on site was a local issue. Monitoring led to modifications in some construction methods, notably improve- ments to the railway sidings and changes in the piling methods used.

Crime
An increase in local crime is normally associated with the construction stage of major projects. The Leiston police division did see a significant increase in the number of arrests in certain offence categories after the start of the project. However, local people not employed on the project were involved in most of the arrests, and in the increase in arrests, with the exception of drink-driving, for which Sizewell B employees (mainly in-migrants) accounted for most arrests and for most of the increase. However, the early diagnosis of the prob- lems facilitated swift remedial action, including the introduction of a shuttle minibus service for workers, the provision of a large bar in the site hostel, the stressing of the problems of drink- driving at site-workers' induction courses, and the exclusion from the site (effectively the exclusion from Sizewell B jobs) of workers found guilty of serious misconduct or crime. After the early stages of the project, worker-related crime fell substan- tially, and the police considered the project workforce to be relatively trouble-free, with fewer serious offences than anticipated.

Residents' perceptions
Surveys of local residents in 1989 and 1991 revealed more negative than positive perceived impacts, increased traffic and disturbance by workers being seen as the main negative impacts. The main positive impacts of the project were seen
to be the employment, additional trade and ameliorative measures associated with the project. The monitoring of complaints about the develop- ment revealed substantially fewer complaints over time, despite the rapid build-up of the project.

7.5.4 Learning from monitoring: Sizewe/1 B and Sizewe/1 C
Table 7.5 shows the nature and auditability of the Sizewell B socio-economic predictions. In contrast to the findings from previous post-auditing studies (see Dipper et al. 1998), a vast majority of the Sizewell B predictions were expressed in quantitative terms. The monitoring of impacts and the auditing of the predictions and mitigation measures revealed (Table 7.6) that many of the predictions used in the Sizewell B public inquiry were reasonably accurate - although there was an underestimate of the build-up of construction employment and an overestimate of the secondary effects on the local economy. Predictions of traffic impacts, and on the local proportion of the con- struction workforce, were very close to the actual outcomes. Mitigation measures also appeared to have some effect. Overall, approximately 60 per cent of the predictions had errors of less than 20 per cent. Explanations of variations from the predictions included the inevitable project modification (particularly associated with new- technology projects, with few or no comparators at the time of prediction), and the very lengthy project authorization process (with a gap of almost
10 years between the predictions and peak construction). Other local issues were revealed by the monitoring, allowing some modifications to manage the project better in the community (Glasson 2005). Unfortunately, such systematic monitoring is still discretionary in the UK and very much dependent on the goodwill of developers.
Information gained from monitoring can also provide vital intelligence for the planning and assessment of future projects. This is particularly so when the subsequent project is of the same type, and in the same location, as that which has been monitored. Nuclear Electric applied for consent to build and operate a replica of Sizewell B, to be known as Sizewell C. A full EIS was produced for the project (Nuclear Electric 1993). Its prediction

of the socio-economic impacts drew directly on the findings from the Sizewell B monitoring study, but this proposed follow-on project fell victim to the abandonment in the early 1990s of the UK nuclear power station programme. How-

Table 7.5 Nature and auditability of the Sizewell B predictions

	No. of	% of total predictions
Nature of prediclion		
Quantitative		
Expressed in absolute terms	35	51
Expressed in % terms	21	30
Qualitative	11	16
Incorporates quantitative and qualitative elements	2	3
Total: all predictions	69	100
Auditability of predictions		
Auditable: monitoring data subject to no or little potential error	30	43
Auditable: but monitoring data subject to greater potential error	28	41
Not auditable	11	16
Total: all predictions	69	100

Source: Chadwick and Glasson 1999

7.6
A UK case study: monitoring the local impacts of the London 2012 Olympics project 7.6.1
Nature of the project and its impacts life cycle

Table 7 .6 Accuracy of auditable Sizewell B predictions

ever, since about 2007 there has been much activity, and increasingly advanced planning, for a new generation of UK nuclear power stations, including a new Sizewell C. In this context the monitoring data from the construction of Sizewell B is proving of considerable value.

The London Olympics 2012 project has been one of the largest projects in Europe, with a peak construction work force of almost 12,000 in 2011. The site of about 250 ha is located in the east

% error in prediction	No. of predictions	
None: prediction correct or within predicted range	15	
Less than 10%	9	16
10-20%	11	19
20-30%	5	g
30-40%	5	g
40-50%		

	2	3
Over50%	8	14
Prediction incorrect, but % error cannot be calculated	3	5
Prediction cannot be audited	11	
Total: all predictions	69	100

7.6.2 Construction stage monitoring

Source: Chadwick and Glasson 1999
% of total

26
of London, approximately 5 km from the centre of the city. The Olympic, Paralympic and Legacy Facilities have been designed to create not only an exceptional venue for the games, but also a last- ing legacy to bring about the regeneration of the formerly rundown Lower Lea Valley - creating a new urban quarter for London. The life cycle of the project is reflected in the chronology of impacts highlighted in the environmental statement (Symonds/EDA W 2004), and summarized in Figure 7.6. This also provides a framework for the monitoring of the biophysical and socio-economic impacts of the project.

The project has a detailed monitoring programme, co-ordinated by the Olympics Delivery Authority
Note: For quantified predictions, the predicted value was used as the denominator in the calculation of the % errors in the table. For non- quantified predictions, the % error could not be calculated and predictions were classified as either 'correct• or 'incorreci', based on assessment by the research team.
(ODA). Two examples of the detailed nature of the monitoring are illustrated below. Figure 7.7 provides an extract from the monthly construc- tion noise monitoring across the site, showing a generally good performance. Table 7.7 provides some extracts from the monthly socio-economics

Post

Premature loss of existing housing, industry, jobs and waste management infrastructure

Potential loss of archaeological baseline

Damage lo built heritage from demolition and conte,:1ual changes

Loss of district character of historic areas

Improved quality of townscape and views

Undergrounding of power cables

Consequences of remediation

Energy efficiency gains from CCHP and other sustainable/renewable energy features incorporated into buildings/structures

Creation of Olympic jobs

'Feel good' factor. social cohesiveness and community pride

Encouragement lo participate in sporting/healthy acfrvities

Impacts on local transport infrastructure

Wind impacts on queues/crowd near large buildings (including Olympic Village)

Potential flood risk due lo Security Perimeter Fence at river erossings

Polent1al impacts from existing contamination in newly public areas

Additional parkland, open ground and allotments

Additional /replacement habitat creation

Improved accessibility/permeability

Crealion of Legacy jobs, with associated skills and training

Improved community facilities (schools, nurseries, creches, medical etc.)

Improved buildings (e.g. 'access for all' standards)

Impact on household waste management infrastl\lclure of LB Newham

Notes: Green "" Significant beneficial, Red "" Significant adverse. Hatched "" Significant with or without mitigation, Plain colour "" Significant without miligation

Figure 7.6

Life cycle of impacts for the London 2012 Olympics project
Source: Symonds/EDAW 2004

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Figure 7.7

Construction noise monitoring across the London 2012 Olympics site (August 2010)

Source: Olympics Delivery Authority 2010
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monitoring, with a focus on the characteristics of the construction workforce. for January 2011, it shows a workforce of almost 12,000 across the two main projects (park and athletes' village). A high proportion of the workforce is locally sourced from within the London boroughs, and much is very local to the site. Recruitment from the unemployed and from black, Asian and ethnic minority groups is also monitored as good against benchmark targets; this contrasts with poorer performance against benchmarks for female recruitment and for recruitment from those with disabilities. The project has used a range of construction work- force development activities to enhance beneficial local recruitment impacts, including: a job broker- age scheme that has placed over 1,250 people (primarily local borough residents) into employ- ment on the project, and a training programme that has exceeded targets by training (up to 2011) 3,250

people (against a target of 2,250), including 400 apprentices (against a target of 350).

A mediation of the relationship between a project and its environment is needed throughout the life of a project. Environmental impact assessment is meant to establish the terms and conditions for project implementation; yet there is often little follow-through to this stage, and even less follow- up after it. Arts (1998) concluded, after a thorough examination of 'ex-post evaluation of EIA', that in practice it is lagging behind the practice of EIA itself. Few countries have made arrangements for some form of follow-up. In those that have, experience has not been too encouraging -

Table 7.7 Workforce/employment monitoring for the London 2012 Olympics site (December 2010)

	Olympic	Athletes' Village
Workforce on site	6500 (benchmark)	5400 (benchmark)
% resident in host boroughs	21	'27

% resident elsewhere in London
34

40

% resident elsewhere in UK
42

30

% residing outside UK/or no information
3

3

% previously unemployed
12
7

10
7

% women
4
11

3
11

% disabled

3

0,5
3

% black, Asian or ethnic minority
19
15

13
15

Source: Adapied from Employment and Skills Update, Olympics Delivery Authority (January 2011)

Figure 7.8

Outcome of EIA follow-up for different stakeholders Source: Morrison-Saunders et al. '2001 reflecting deficiencies in often over-descriptive EISs, inadequate techniques for follow-up, organiza- tional and resource limitations, and limited support from authorities and project proponents alike. Yet many projects have very long lives, and their impacts need to be monitored on a regular basis. Morrison-Saunders et al. (2001) show how this could bring positive outcomes for different stakeholders.

Figure 7.8 shows the benefits not only to the proponent and the community (as exemplified by the Sizewell B case study), but also to the regulator - in the form of a better decision and improve- ment of the EIA process. Such monitoring can improve project management and contribute to the auditing of both impact predictions and mitigating measures. Monitoring and auditing can provide essential feedback to improve the EIA process, yet this is still probably the weakest step of the process in many countries. Discretionary measures are not enough; monitoring and auditing need to be more fully integrated into EIA procedures on a mandatory basis.

SOME QUESTIONS

The following questions are intended to help tile reader focus on the key issues of this chapter, and to start building some 1111derstmuling of the importance and nature of monitoring and auditing in EIA.

What do you understand by the distinction between 'before the decision' and 'after the decision' in EIA?

2 Why is it important to continue the EIA process beyond the decision for those projects which proceed to implementation?

3 What do you understand by the distinction between monitoring and auditing in EIA?

4 Consider the sort of monitoring information which would be useful to collect for a major project with which you are familiar. Include indicators and underlying factors, and quantitative and qualitative information.

S Why do you think that there has been such resistance in many countries to more mandatory monitoring and auditing systems for EIA?

6 Compare and contrast some of the key features of the monitoring systems in California and Hong Kong.

7 Review the problems that can be associated with post-auditing studies, as set out in Table 7.3, and consider how some of these problems might be overcome.

8 As exemplified by the Sizewell B project, consider ways of overcoming the two highlighted methodological issues, often encountered in monitoring, of (i) disaggregating project-related impacts from baseline trends, and (ii) identifying the indirect impacts of projects.

9 Review the relative accuracy of auditable Sizewell B predictions, as displayed in Table 7.6. What factors might contribute to the findings set out there?

10 Figure 7.6 illustrates the importance of monitoring over the life cycle of a project. Some of the impacts noted in the figure are likely to be easier to monitor than others. Briefly run through the impact list and identify, as far as possible, relevant impact indicators that could be used in the monitoring process for the London 2012 Olympics project.

11
Drawing on the two UK monitoring case studies, plus any others with which you might be familiar, outline the potential benefits of EIA monitoring/follow-up to the relevant sets of stakeholders identified in Figure 7.8.

Note

Early drafts of the EC Directive did include a requirement for an ex-post evaluation of EIA projects. Section 11 of the 1980 draft (CEC 1980) stated that the competent authority should check at set intervals whether the provisions allached to the planning permission are observed or adequate, or other provisions for environmental protection are observed, and whether additional measures are required to protect the environment against the project's impacts.

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Practice

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8
An overview of UK 8.1
Introduction

8.2
Number and type of EISs and projects 8.2.1
Number and broad location of E!Ss

practice to date
••

Part 3 considers £IA practice: what is done rather than what should be done. This chapter provides an overview of the first 20 years or so of UK practice since EC Directive 85/337 became operational. We develop this further with reference to particular case studies in Chapter 9. rhe case studies seek to develop particular themes and aspects of the £IA process raised in this and

in earlier chapters (for example, on the treatment of alternatives, of public participation and on widening environmental assessment to also consider social and economic issues). The case studies are largely UK-based, and project-focused, although two cases of SEA are also included. Chapter 10 discusses international prac- tice in terms of 'best practice' systems, emerging EIA systems and the role of international funding agencies in EIA, such as the World Hank.
These chapters can be set in the context of international studies on £IA effectiveness, whose results have been written up by Sadler (1996, 2012). In the 2011 study, Sadler sets three effective- ness tests, setting out an effectiveness 'triage' (three clearance bars): (1) enabling conditions (what must or should be done; legal and institutional frame- work and methodological realities); (2) state of practice (what is done; macro and micro level cases of good practice - what is the art of the possible); and (3) effectiveness and performance (what is the outcome; contribution to decision-making and environmental benefits). Sadler notes that these questions and the attendant techniques for investi- gating them must be seen in the context of the decision-making framework in which the relevant EIA system operates.
Chapter 8 broadly addresses Sadler's first two points in sequence. Section 8.2 considers the number, type and location of projects for which £[As have been carried out in the UK, as well as where the resulting EISs can be found. Section 8.3 discusses the stages of £IA before the submission of the EIS and application for authorization. Section 8.4 addresses what has, to date, been the most heavily studied aspect of EIA practice, the quality of EISs. Section 8.5 considers the post- submission stages of EIA, and how environmental information is used in decision-making by LPAs and inspectors. Section 8.6 considers legal chal- lenges to £IA, many of which have informed the recent changes to UK legislation and guidance discussed at Chapter 3. Finally, section 8.7 discusses the costs and benefits of £IA as seen from vari- ous perspectives. Sadler's third point is partially addressed by government-published good-practice guides on EIA preparation and review (e.g. DETR 1999a, 2000; DCLG 201 la), which over time have introduced some policy changes in response to research findings regarding EIS and EIA effec- tiveness.
The information in this chapter was correct at the time of writing in mid-2011; it will obviously change as more E!Ss are carried out.

This section considers how many, and for what types of projects, E!Ss have been produced. It concludes with a brief review of where collections of E!Ss are kept. UK EIS collections, and databases on E!Ss, are fragmented (see Section 8.2.3). Analysis is further complicated by several problems. First, some projects fall under more than one schedule classification; for exam pie mineral extraction schemes (Schedule 2.2) that are later filled in with waste (Schedule 2.11), or industrial/residential developments (Schedule 2.10) that also have a leisure component (Schedule 2.12). Second, the mere description of a project is often not enough to identify the regulations under which its £IA was carried out. For instance, power stations may fall under Schedule 1.2 or 2.3(a), depending on size. Roads may come under highways or planning regulations, depending on whether they arc trunk roads or local highways. Third, many EISs do not mention when, by whom or for whom they were prepared. Fourth, locational analysis after 1995 is complicated by local government reorganization and many changes in the nature and boundaries of authorities in England, Scotland and Wales. All these factors affect the analysis. This chapter is based primarily on information from DCLG (2011b), !EMA (2011), supplemented by older information from Wood and Bellanger (1998) and Wood (1996, 2003).

Between the mid-1970s and the mid-I 980s, approximately 20 EISs were prepared annually in the UK (Petts and Hills 1982). After the imple- mentation of Directive 85/337, this number rose dramatically and, despite the recession, about 350 E!Ss per year were produced in the early 1990s; but, as can be seen from Figure 8.1, this number began to drop in the mid-1990s partly as a result of a fall in major development activity under the planning regulations. However, the numbers quickly recovered in the late 1990s and, as noted in Chapter 3, there were over 600 per year for several years after the implementation of the 1997 amendments to the Directive. This probably reflected many factors - more projects, included in the amended Directive, a stronger UK economy and concern by developers and LPAs about cer- tain court judgements involving the EIA Directive.

Figure 8.1

EISs prepared in the UK (1991-2008) Source: DCLG (2011b)

By the end of 2008, over 9,000 E!Ss had been prepared, with approximately 70 per cent produced under the Planning Regulations for England, Wales and Scotland. The remainder arc for projects in Northern Ireland and, more significantly, for projects under the other consent procedures (e.g. highways, forestry) discussed in Chapter 3. However the fall in numbers since 2005 illus- trates that EIS activity can perhaps be seen as an interesting measure of the economic fortunes of a country.

In parallel with the increase in the number of EISs, the participants in EIA have become increasingly familiar with the process. Surveys of UK local authorities carried out by Oxford Brookes University in the mid-1990s showed that over 80 per cent of LPAs even then had received at least one EIS. On average, strategic-level auth- orities (county and regional councils and national park authorities) had received 12 EISs and local-level authorities (district, borough, metro- politan boroughs and development corporations) had received four. Surveys of environmental consultants (e.g. Radcliff and Edward-Jones 1995; Weston I995) found that about one-third of the consultancies surveyed had prepared 10 or more EISs. As noted, the total number of E!Ss is now over 9,000, compared with approximately 2,500 by the end of 1995, and LPA and consultancy activity and experience with the process has continued to grow accordingly. figure 8.2 shows the distribution of EISs by national authority. With only about 10 per cent of the UK population, the EIS activity in Scotland is often much higher than the UK average; recent activity includes many Scottish wind farm developments.

Types of projects

Figure 8.3(a) shows the types of projects for which E!Ss were prepared in the early years of EIA in the UK. The largest numbers were for project types in waste (largely landfill/raise projects, wastewater or sewage treatment schemes and incinerators), urban/retail developments, roads, extraction schemes and energy projects (Wood and Bellanger 1998). In contrast, data for 2004-2010 (for England only) highlights the predominance of urban/retail development projects. Figure 8.3(b) (also for England) illustrates some regional variations - for example between project types in the NE and SE of the country.

Table 8.1 shows the distribution of E!Ss pro- duced under other consent systems. There are basic- ally three groups of projects relating to transport, agriculture and fisheries, and energy. The highway

Figure 8.2

Country distribution of EISs produced under the GB planning consent systems (including England, Wales and Scotland)
Source: DCLG (2011b)

group is a large group, although numbers fell away around the turn of the century, but have increased again since. In contrast, forestry, land drainage and fish farming projects have recently fallen back from much higher numbers at the turn of the century. Electricity and pipeline works is a major category, boosted by the more recent addition of gas pipelines and offshore wind farms to the category; there have been about 600 EISs in total in this category. In contrast, and as expected, there have been only a handful of EISs for the decom- missioning of nuclear reactors, following the

introduction of legislation in 1999; but more will follow as the UK's ageing reactors reach the end of their operational life.

In the first few years following the implemen- tation of Directive 85/337, 40 per cent of E!Ss were produced for the public sector and 60 per cent for the private sector (Wood 1991). The percen- tage of private sector projects has since increased considerably owing to privatization, but much of this was offset in the 1990s and early 2000s by the heavy government investment in - and con- sequently EISs for - new roads. A particularly

(a)
% of total EIS activity

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(b)
1

1

Figure 8.3

Trends in EISs for particular project types. (a) By project type % of total EIS activity-comparing UK (1988-1998) and England (2004-2010); (b) By project type -comparing numbers of EISs produced for particular English regions (2004-2010)
Source: (a) Wood and Bellanger 1998; (a and b) adapted from DCLG Library database 2011

Table 8.1 EISs produced under other consent systems (highways, forestry, electricity, etc.)

Year
EISs received

Highways
Harbour works
Transport
Forestry
Land drainage
Fish farming
Nuclear
Electricity

and works

reactor
and pipelines

decommis-
works

sioning
(including

gas pipelines

and offshore

w,nd farms)

1991
43
0

8
10
0

29

1992
38

2

9
11
0

23

1993
52
3
3
30
14
0

12

1994
61
5
3
18
9

23

1995
27
7
1
15
22
0

19

1996
19
8
3
12
29
0

17

1997
17
9
4
13
22
1

25

1998
6

10
13
20
2

12

1999
5
6
9
11
27
10
0
21

2000
3
12
8
7
17
13
0
42

2001
8
7
2
10
31
20
0
48

2002
21
4
7
8
37
32
2
54

2003
12
1
8
10
8
17
0
42

2004
17
2
6
3
3
11
2
53

2005
28
3
2

5
17
12
2
64

2006
24

1
1
0
0

27

2007
30

3
2
0
0
1
25

2008
11

3
2
0
0
2
42

Total
412
70
73
177
273
118
10
578

Source: DCLG 2011b

interesting subset is that of those EIAs for which one agency acts as both the project proponent and the competent authority (e.g. the Highway Agency for roads).

8.2.3 Sources of E/Ss

Copies of EISs received by English LPAs are forwarded to the Environmental Assessment Division of the Department of Communities and Local Government (DCLG) library in London once the application has been dealt with. However, this process can be a long one. The DCLG library is open to the public by appointment; photocopies can be made on the premises. In Wales, planning EISs are forwarded to the Welsh Assembly. In Scotland, all EISs are sent to the Scottish Assembly, while in Northern Ireland they are sent to the Northern Ireland DoE. Other government agencies, such as the Highways Agency, also hold collections and lists of the EISs that fall under their juris- diction. l"hese collections are, however, generally not publicly available, although limited access for research purposes may be allowed.

In addition to government collections, EIS collections can also be found in several universities (e.g. at Oxford Brookes University, Manchester University and University of East Anglia), and at the Institute of Environmental Assessment and Management ()EMA). Some EISs can also be found on the Internet, although this access may be fleeting and only as long as there is an active planning application. The Institute of Environ- mental Management and Assessment (!EMA), based in Lincoln, has a substantial collection of EISs, which are available by pre-arrangement with institute staff, but primarily for corporate bodies. The EIA Centre at the University of Manchester keeps a database of EISs and EIA-related literature: its collection of E!Ss is, like its database, open to the public, by appointment. Oxford Brookes University's collection of approximately 1,000 E!Ss is open to the public, by appointment, and photocopies can be made on the premises. Other organizations, such as the Royal Society for the Protection of Birds, the Institute of Terrestrial Ecology, Natural England and the Campaign to Protect Rural England, as well as many environ- mental consultancies, also have limited collections of EISs, but these arc generally kept by individuals within the organization for in-house use only, and are not available to the public. E!Ss are also increasingly being made available on the websites of local authorities and/or developers.

The difficulty of finding out which E!Ss exist, and their often prohibitive cost, can make the acquisition and analysis of EISs arduous. Various organizations (e.g. !EMA, the University of Manchester and Oxford Brookes University), have called for one central repository for all E!Ss in the UK. One positive new development was the launch in Spring 2011 of the IEMA's Quality Mark system. To acquire the Quality Mark, organizations will have to sign up to seven EIA commitments (relating to EIA team capabilities, EIA content, EIA presentation etc.). One of the indirect benefits of the scheme is that it will gather a substantial proportion of the UK's annual EIS output and make their non-technical summaries (NTSs) available to search on line, which will provide a valuable resource for research and practice.

process

This is the first of three sections that discuss how EIAs are carried out in practice in the UK. It focuses on some of the pre-EIS submission stages of Eli\, namely screening, scoping and pre-submission consultation.

Underpinning any analysis of the implementation of EIA in the UK are the requirements of the EC and UK government legislation. Under the original legislation, competent authorities in the UK were given wide discretion to determine which Schedule 2 projects require EIA within a framework of varying criteria and thresholds established by the 40-plus regulations and additional guidance. Generally, this screening process worked quite well (CEC 1993). However, some specific problems did arise regarding screening in the UK. for example, because of the largely discretionary system for screening, Ll'As often - about half of the time - required an EIS to be submitted only after they had received a planning application (DoE 1996). For the same reason, screening requirements varied considerably between competent authorities. In the early days of EIA, the decision not to require an EIA had often been taken by junior members of staff who had never considered the need for an EIA, or who thought (incorrectly) that no EIA was required if the land was designated for the type of use specified in the development plan, or if the site was being extended or redeveloped rather than newly developed. Similarly, different government regional offices gave different decisions on appeals for what were essentially very similar developments (Gosling 1990).

The screening criteria established by the amend- ments to the Directive sought to reduce these problems post-1999 (see Sections 3.4 and 4.3). A government-sponsored study, undertaken by the Oxford Brookes University's !AU (!AU 2003), provided some research evidence on the nature and characteristics of LPA screening decision- making under the T&CP (EIA) Regulations 1999. The research, based on survey responses from over 100 LPAs in England and Wales in 2002, sought information on frequency of screening activity, on main considerations in the LPA decision whether or not an EIA should be undertaken and on the importance of different screening criteria. For screening activity in general, and for LPAs in total, the indicative thresholds were identified as the main consideration in screening decision-making (44 per cent of LPAs). The criteria of Schedule 3 and associated guidance (project is a major development of more than local importance, is in a sensitive location or will have complex/hazardous environmental effects), which require a greater degree of professional judgement, were noted second most frequently (35 per cent of LPAs).

Tables 8.2 and 8.3 relate to views on the LPAs' (then) most recent single screening decision. Using regulations and thresholds is seen as the most effective approach overall, but professional judgement is an equally important approach among the more experienced LPAs.

The most important factors in the screening decision are the size and scale of the project with 87 per cent of LPAs indicating that these are 'important' or 'very important'. Proximity to sensitive environmental receptors (87 per cent) and the nature of the project (74 per cent) arc the next most important factors. At the other extreme, only 15 per cent indicated that risk of accidcn ts was important or very important. The main constraints on screening decision-making were identified as lack of resources (45 per cent), time- frame constraints (44 per cent), lack of clarity of the regulations (33 per cent) and uncertainty over baseline data, project characteristics, etc. (32 per cent). Overall, the findings show that while thresh- olds are clearly important in the screening decision, they are often conditioned by professional judge- ment. In other words, in themselves, they do not provide sufficient justification for a screening decision (Weston 2000). This is supported by the 2011 guidance on EIA, which notes that

the basic question to be asked is: 'Would this particular development be likely to have significant effects on the environment?' for the majority of development proposals, it will be necessary to consider the charac- teristics of the development in combination with its proposed location, in order to determine whether there arc likely to be significant environmental effects. (DCLG, 201la)

Table B.3 Importance of issues in most recent screening decision

Issue (n = 97)	Very important (%)	Important (%)
Size/ scale of project	47	40
Proximity to receptor	44	43
Nature of project	42	32
Traffic/access impacts	33	32
Ecological impacts	32	31
Emissions	31	31
Landscape impacts	26	35
Cumulative impacts	20	26
Economic impacts	6	24
Social impacts	5	22
ControversyIconcern	9	16
Risk of accidents	5	10
Other	3	

Source: IAU 2003

Table B.2 Most effective approach in most recent screening decision

Screening
LPA(%)
< 5 EIAs 56
>5 EIAs

n = 56
(n = 26)
(n = 30)

Consultation with own organization
3.6
7.7

0.0

Community consultation
12.5
11.5
13.3

Asked for screening direction from Secretary of State
0.0
0.0
0.0

Followed screening guidance in local development plan

	1.8	3.8	0.0
Followed guidance in other plans/policies	7.1	11.5	3.3
Used regulations and thresholds as guide	35.7	38.5	33.3
Consulted examples of other similar projects	1.8	0.0	3.3
Used professional judgement/expenence	26.8	19.2	33.3
Used checklist to identify possible impacts	1.8	0.0	3.3
Used other formal technique	1.8	3.8	0.0
Own standard approach	0.0	0.0	0.0
Likely controversy of proJect	0.0	0.0	0.0
Other	7.1	3.8	10.0

Source: IAU 2003

As noted in Chapter 3, screening is still con- sidered a problematic area in several EU Member States, including the UK. A survey of UK practi- tioners reported in a recent IEMA study (2011) found that while most practitioners agreed that the UK's screening process was an effective tool to ensure that only projects likely to have significant environmental effects are subject to an EIA, there was still serious concern that EIA had not been required for some Schedule 2 projects with what they considered to be likely significant environ- mental effects. Over time, this has led to a number of important legal challenges, some of which are discussed in Section 8.6. !"his might partly explain the lower level than might be expected of EIA activity for a country of England and Wales population size, and in comparison with other EU Member States with similarly large populations.

Progress has been made over the last decade, through a combination of some or all of the following: simplified procedures for small-scale development applications, adoption of thresholds, regulatory initiatives against the 'salami slicing' of projects (into sub-projects that then fall below threshold levels), and improved guidance on the application of screening procedures. The Scottish Government has introduced an example method- ology for undertaking case by case screening (Scottish government 2007), although DCLG (201la) guidance still refers to screening thresholds. There has also been progress on the automation of screening procedures. For example, in Denmark, an electronic model has been developed for intensive animal farming projects in which the developer simply, by inserting the required data in a calculation sheet, may get a clear picture of whether the proposed project will result in an EIA procedure or not. For the UK, see Rodriguez- Bachiller and Glasson (2004), for the Screen Expert System, and also for a Scope Expert System, developed at Oxford Brookes University.

Competent authorities also have much discretion to determine the scope of ElAs. As discussed in Chapter 3, the original Directive 85/337's Annex III was interpreted in UK legislation as being in part mandatory and in part discretionary. A survey of
early EIS output (Jones et al. 1991) showed that although the mandatory requirements of the legislation were generally carried out, the discre- tionary elements (e.g. the consideration of alterna- tives, forecasting methods, secondary and indirect impacts, and scoping) were, understandably, carried out less often. Subsequent studies showed that although early scoping discussions between the developer, the consultants carrying out the EIA work, the competent authority and relevant consultees were advised in government guidance and were considered increasingly vital for effective EIA (Jones 1995; Sadler 1996), in practice, pre- submission consultation was carried out only sporadically. for instance, a survey of environ- mental consultants (Weston 1995) showed that only 3 per cent had been asked to prepare their EJSs before site identification, and 28 per cent before detailed design. LPAs were consulted by the developer before EIS submission in between 30 and 70 per cent of cases, although this subse- quently increased (DoE 1996; Lee et al. 1994; Leu et al. 1993; Radcliff and Edward-Jones 1995; Weston 1995).
As noted in Chapters 2 and 3, the amended EC 1997 Directive and subsequent UK regulations have raised the profile of scoping in the EIA process. The ODPM study noted earlier (IAU 2003; Wood 2003) also carried out research on the nature and characteristics of scoping activities by LPAs, consultants and statutory consultees. Nearly 75 per cent of the LPAs had been involved in producing scoping opinions. /\II three sets of stakeholders ranked very high the preliminary assessment of characteristics of the site, considera- tion of mitigation and consideration of impact magnitude in formulating the scoping opinion/ report. Similarly, all ranked professional judgement and consultation within their own organization as key approaches to impact identification; use of legal regulations and thresholds were also very important for LPAs and consultancies, but much less so for statutory consultees. Table 8.4 shows the issues of most concern in the most recent scoping project (at the time of the survey) for each group of participants in the process. There is considerable similarity in emphasis between the LPAs and consultancies, with traffic/transport, landscape/ visual and flora/fauna issues ranking particularly high. For statutory consultees, there are some
Table 8.4 Ranking of issues of major concern in most recent project scoping opinion/report (% ranking of major concern)

LPAs Consul- Statutory
Table 8.5 The frequency of inclusion of environmental topic chapters in a sample of 100 UK environmental statements from 2010

tancies consultees (n = 78) (n = 98) (n =28)
Environmental topic
{bold text denotes that the topic is included in either Article 3 or Annex IV of the EIA Directive)
Social issues
10
20
11

Culture/heritage
19
29

18

Economic
21
22
4

Flora/fauna
46
50
68

Soil
18
20
21

Air quality
35
21
14

Noise and vibration
42
45
11

Other emissions
26
31
39

Climatic factors
6
5
7

Waste disposal
13
19
32

Water resources
37
31
43

Geo-technical issues
18
21
29

Landscape/visual
58
57
32

Traffic/transportation
47
55
11

Risk of accidents
5
9
7

Inter-relationships of above
18
17
43

Others
3
9
4

Source: IAU 2003

Occurrence rate in 100 UK
Environmental Statements from 2010

similarities, but other environmental issues (e.g. other emissions, waste disposal) come more into play. Climatic factors and risk of accidents (health and safety) ranked surprisingly low, reflecting perhaps uncertainty about what were then seen as more long-term and less predictable issues.

Ecology (flora and fauna)

92%

Noise (and vibration)
92%

00%

Landscape/townscape/visual analysis
88%

Transport
88%

Cultural/built heritage (inc. archaeology)
82%

Soil and land quality/ground conditions
81 %

Air
79%

Socio-economic	64%
Cumulative effects (interactions/ inter-relationships)	46%
Waste	28%
Climate change	17%
EMP, summary - residual effects and mitigation	17%
Population/human beings	13%
Amenity, access, recreation, rights of way	12%
DaylighVsunlight	11%
Material assets	10%
Micro-climate/wind	9%
Electronic interference (radio and TV)	7%
Sustainability	7%
Public health	6%
Lighting	5%
Aviation	5%
Geomorphology and coastal processes	4%
Energy	3%
Shadow flicker	3%

8.4
EIS quality 8.4.1
1 Academic studies of EIS quality

Considerable experience has been gained with screening and scoping. After initial hiccups, the screening process now seems to be relatively well accepted and has been refined after the 1999 amendments. Scoping is generally considered to be a very valuable and cost-effective part of EIA by all those concerned, and again following the 1999 amendments, has increased in significance in the UK EIA process although, in comparison with 10 of the 12 new EU Member States, for example, it is still not mandatory in the UK - but it is clearly encouraged by good practice guidance. l"he good practice guidance on screening and scoping by the IPC for NSIPs has already been set out in Section 3.5.7. However, there is still a real concern that a combination of factors, including risk aversion, poor planning and commercial reality, may be leading to over-broad and insufficiently focused scoping activity- with 'everything plus the kitchen sink' included to be on the safe side. Table 8.5
Source: IEMA 2011

shows the frequency of inclusion of environmental topic chapters in a sample of 100 UK environmental statements, submitted in the UK in 2010, which were reviewed by the IEMA (2011).
The review found that over 90 per cent included chapters assessing ecology, noise and water effects (Table 8.5), with a further five environmental issues being found to have their own chapter in nearly 80 per cent of all the ES reviewed. Overall this research found that the average UK environmental statement in 2010 had 9.63 environmental topic chapters. While IEMA's analysis did not extend to

assessing whether the inclusion of each chapter was appropriate it is clear that current practice in scoping rarely leads to an assessment focused on a handful of key environmental issues (IEMA 2011).

As we mentioned in Section 8.1, the preparation of high-quality EISs is one component of an effective translation of EIA policy into practice. Submission of E!Ss of the highest standard from the outset reduces the need for costly interaction between developer and competent authority (Ferrary 1994), provides a better basis for public participation (Sheate 1994), places the onus appropriately on the developer and increases the chance of effective EIA overall. That said, the entirety of environmental information is also important, and the advice of statutory consultees, the comments of the general public and the expertise of the competent authority can help to overcome the limitations of a poor EIS (Braun 1993). This theme is considered further in Section 8.6 on judicial review.

Environmental impact statement quality in the UK is affected by the limited legal requirements for EIA and by the fact that planning applications cannot be rejected if the EIS is inadequate, that some crucial steps of the EIA process (e.g. public participation and monitoring) are not mandatory, and that developers undertake E!As for their own projects. This section first considers the quality of E!Ss produced in the UK, based on several academic studies. It continues with a brief discussion of other perceptions of EIS quality, since competent authorities, statutory consultees and developers require different things from EIA and may thus have different views of EIA quality. It concludes with a discussion of factors that may influence EIS quality.
A range of academic studies of EIS quality were carried out in the first 10 years of the EIA Directive's implementation, typically using the criteria of Lee and Colley (1990) (see Appendix 4). Hascd on these criteria, E!Ss were divided into 'satisfactory' (i.e. marks of A, B or C) and 'unsatisfactory' (D or below). Table 8.6, which summarizes some of the findings, shows that EIS quality increased over time, but only after dismal beginnings. Generally, the description of the project, and communication and presentation of results, tended to be done better than the identification of key impacts, alternatives and mitigation.
Some studies focused on specific project types: for instance Kobus and Lee (1993) and Pritchard et al. (1995) reviewed EISs for extractive industry projects, Prenton-Jones for pig and poultry

developments (Weston 1996), Radcliff and Edward- Jones (1995) for clinical waste incinerators, Davison (1992) and Zambellas (1995) for roads, and Gray and Edward-Jones (1999) for forestry projects.

Table 8.6 Examples of aggregated EIS quality (percentage satisfactory·)

Lee and
Wood and
Lee and
Lee et al.
Jones 1995
Barker
DoE 1996

Colley 1990
Jones 1991
Brown 1992
1994

Wood 1999

Sample size
12
24
83
47
40
24
50

1988-89
25
37
34
17

36

1989-90

48

1990-91

60
47

1991-92	'just over half' 58
1992-93	60
1993-94	
1994-95	66
1995-96	

• Satisfactory means marks of A, B or C based on the Lee and Colley criteria (1990 or 1992)

Other studies analysed the quality of specific EIS environmental components, for instance, landscape/visual (e.g. Mills 1994) and socio- economic impacts (e.g. Hall 1994). These studies also broadly suggested that EIS quality was not very good, but improving.
We are not aware of similarly formal, large scale recent studies of UK EIS quality, but indications are that EIS quality has continued to improve since then, albeit not consistently:

Consultants working on large or controver- sial projects have had to improve the quality of their work substantially in recent years
... That has been one benefit of increased scrutiny of ESs on the part of statutory stake-

holders and groups representing local resi- dents and the public ... but the consensus seems to be that although the quality of ESs prepared for large and/or controversial pro- jects has gone up, overall quality remains highly variable. 'Patchy' is the word most fre- quently used to describe current standards, both in terms of the quality of ESs themselves and the scrutiny they arc given by local auth- orities. (ENDS Directory 2007)

These findings must, however, be considered in the wider context of 'quality for whom?' Academics may find that an EIS is of a certain quality, but the relevant planners or consultees may perceive it quite differently. For instance, the DoE (1996) study, Radcliff and Edward-Jones (1995), and Jones (1995) found little agreement about EIS quality between planners, consultees and the researchers; the only consistent trend was that consultees were more critical of EIS quality than planners were.

In interviews conducted by the Impacts Assess- ment Unit (DoE 1996), planning officers thought EISs were intended to gain planning permission and minimize the implication of impacts. Just over 40 per cent felt that EIS quality had improved, although this improvement was usually only marginal. Most of the others felt that this was difficult to assess when individual officers see so few E!Ss and when those they do see tend to be for different types of project, which raises different issues. A lack of adequate scoping and discussion of alternatives was felt to be the major problem. EISs were seen to be getting 'better but also bigger'. Some officers linked EIS quality with the reputation of the consultants producing them, and believed that the use of experienced and reputable consultants is the best way to achieve good quality EISs.

Statutory consultees differed about whether EIS quality was improving. They generally felt that an EIS's objectivity and clear presentation were important and were improving, yet still wanting. LPAs, developers, consultants and consultees generally thought the key EIS criteria of compre- hensiveness, objectivity and clear information were improving but still generally not good. Developers and consultants linked EIS quality with ability to achieve planning permission. Consultants felt that developers were increasingly recognizing the need for environmental protection and starting to bring in consultants early in project planning, so that a project could be designed around that need. One reason for this improvement may be that pressure groups were becoming more experienced with EIA, and thus had higher expectations of the process (DoE 1996).

studies

with only 17 per cent of those prepared in-house. Similarly, EISs prepared by independent applicants have tended to be better (C/D) than those prepared by local authorities for their own projects (D/E) (DoE 1996).

The experience of the developer, consultant and competent authority also affects EIS quality. For instance, Lee and Brown (1992) showed that of EISs prepared by developers (without consul- tants) who had already submitted at least one EIS, 27 per cent were satisfactory, compared with 8 per cent of those prepared by developers with no prior experience; Kobus and Lee (1993) cited 43 and 14 per cent respectively. A study by Lee and Dancey (1993) showed that of EISs prepared by authors with prior experience of four or more, 68 per cent were satisfactory compared with 24 per cent of those with no prior experience. The DoE (1996) study showed that of the EISs prepared by consultants with experience of five or fewer, about SO per cent were satisfactory, compared with about 85 per cent of those prepared by consultants with experience of eight or more. EISs prepared for local authorities with no prior EIS experience were just over one-third satisfactory, compared with two- thirds for local authorities with experience of eight or more (DoE I996). This suggests that EIS quality should improve over time simply by dint of practitioners gaining more experience.

Other detenni,umts of EJSs' quality include the availability of Eli\ guidance and legislation, with more guidance (e.g. DETR 2000; DoT 1993; local authority guides such as that of the Essex Planning Officers' Association 2007) leading to better EISs; the stage in project planning at which the development application and EIA are submitted, EISs for detailed planning applications generally being better than those for outline applications; and issues related to the interaction between the parties involved in the EIA process, including commitment to EIA, the resources allocated to the EIA and communication between the parties.

Environmental impact statement length also shows some correlation with EIS quality. For instance, Lee and Brown (I992) showed that the percentage of satisfactory EJSs rose from IO for EISs less than 25 pages long to 78 for those more than 100 pages long. In the DoE (1996) study, quality was shown to rise from an average of E/F for EISs of less than 20 pages to C for those of over SO pages. However, as EISs became much longer than 150 pages, quality became more variable: although the very large EISs may contain more information, their length seems to be a symptom of poor organization and coordination. IEMA (2011) found the main text of many EISs to be more than

350 pages long, with those for nationally significant infrastructure projects typically being longer still. It noted that:

many practitioners are frustrated with the length of ESs and have concerns about the value these documents give to consenting authorities, let alone wider groups such as the public ... 25% of respondents [to an online survey! consider that the current length of ESs reduces the value of the assessment's findings to all audiences, even those with specialist environmental knowledge, such as the Environment Agency. Respondents indicate that this situation is worse in relation to less technical audiences. More than two fifths of respondents (42%) suggested that long ESs regularly reduce the value of an EIA's findings to stakeholders in non-statutory bodies and nearly two thirds (66.5%) believing the current length of the documents reduces the value of EIA to local communities. (!EMA,
2011)

process

After a competent authority receives an EIS and application for project authorization, it must review it, consult with statutory consultees and the public and come to a decision about the project. This section covers these points in turn.
with only 17 per cent of those prepared
-
carried out primarily by reading through the EIS, consulting with other officers in the competent authority, consulting externally and comparing the EIS with the relevant regulations (DoE 1996). Despite the ready availability of the Lee and Colley (1992) review criteria, only about one-third of local authorities use any form of review methods at all, and then usually as indicative criteria, to identify areas for further investigation, rather than in a formal way. About 10-20 per cent of E!Ss are sent for review by external consultants or by !EMA; but even when outside consultants are hired to appraise an EIS, it is doubtful whether the appraisal will be wholly unbiased if the consultants might otherwise be in competition with each other. There are also problems involved in getting feedback from the reviewing consultants quickly enough, given the tight timetable for making a project determination (DoE 1996). An innovative approach being used by some developers requires consultants who are bidding to carry out an ElA to include as part of their bid an 'independent' peer reviewer or 'critical friend' who will check and guarantee the
quality of the consultants' work.
In the early days of EIA implementation in the UK, planning authorities required additional EIA information in about two-thirds of cases (e.g. Jones 1995; Lee et al. 1994; Weston 1995). This was usually done informally, without invoking the regulations. Circular 2/99 supports this by noting that • .. if a developer fails to provide enough information to complete the ES, the application can be determined only by a refusal' (Regulation 3, DETR 1999b). We are not aware of similar more recent studies, although it is clear that planning authorities continue to require additional EIA information where they feel that the E!Ss do not provide adequate information.

Competent authorities are required to send ElSs to statutory and non-statutory consultees, and make them available to the public for comment. Public participation in the UK EIA system is typically limited to a few weeks following EIS submission, and notice of an EIS is normally in the form of an advertisement in a local newspaper, a site notice, and notification of neighbours. Increasingly, E!Ss
are placed on the Internet, as well as being made available in hard copy form in council offices or libraries, and being available for purchase at a 'reasonable cost' as required by legislation.
Planning officers 'place great reliance on the consultees to review, verify and summarize at least parts of ESs' (Kreuser and Hammersley 1999). Local interest groups are often particularly active at this stage, reviewing and commenting on EIS quality as well as the planning application. Where the EIS contains insufficient information about a specific environmental component, competent authorities may put the developer and consultee in direct contact with each other rather than formally require further information themselves (DOE 1996).
The formal EIS may be only one of several similar documents presented as part of a planning application. !EMA (2011) note that

In many of the UK's current development consent regimes there is considerable duplica- tion of information between the Environ- mental Statement and other documents submitted alongside the application. A good example of this inefficiency can be seen in one of the UK's newest consent regimes, which was specifically designed to operate in a streamlined manner: applications for

IJ\"ationally Significant Infrastructure Projects]. Of the first few applications accepted by the Commission, a number have included an ES. However, included within these submissions were several additional assessment reports, addressing the predicted effects of the devel- opments on: flood risk, sustainability, health, transport, carbon emissions, historic environ- ment, landscape, waste and natural features. All of these issues were included within the ESs themselves and are regularly addressed in EIA practice.
carried out

requires impact assessments to be supplied with pollution permit applications. Therefore in their role as statutory planning EIS consultees, [they] are unlikely to waste time complaining about the poorly detailed designs given in a planning EIS, if they will be receiving another type of EIA document which precisely covers their area of concern. The Didcot B case study showed that even though HMIP considered the EIS to be satisfactory, they later demanded major design changes. [In the case of the Hamilton Oil gas terminal project in Liverpool Bay] JIM II' raised no objectives to the EIS, but then rejected the (Integrated Pollution Con- trol[authorization ...

This problem of duplicate authorization procedures and the issues relating to discussion between EIA participants will be discussed further in case studies in Chapter 9.
As we noted in Chapter 1, one of the main purposes of EIA is to help to make better decisions, and it is therefore important to assess the per- formance of EIA in relation to this purpose. It is also important to remember that all decisions involve trade-offs. These include trade-offs in the EIA process between simplification and complexity, comprehensiveness and focus, urgency and the need for better information, facts and values, and certainty and uncertainty (Wood 2003;
!EMA 2011). There are also trade-offs of a more substantive nature, in particular between the socio- economic and biophysical impacts of projects - sometimes reduced to the 'jobs vs. the environ- ment' dilemma - and between groups who would win and lose from a project. Box 8.1 illustrates these trade-offs in relation to the UK government's decision to cancel a third runway at Heathrow Airport.

PLANNED THIRD RUNWAY AT HEATHROW IS SCRAPPED

Plans to build a third runway to increase capacity at London's overstretched Heathrow Airport will be cancelled by the new Coalition government. The text of the pact between the Conservatives and Liberal Democrats specifically identifies 'the cancellation of the third runway at Heathrow' as one of the parties' agreed environmental measures. It also pledges to refuse extra runways at Gatwick and Stansted.
But business representatives immediately warned the new government that restricting London's transport capacity would hit the capital's competitiveness and was a 'bad way to start'. The decision will also be a blow to the airport's operator, BAA. London First, which represents big businesses in the capital, said the government must come up with a 'plan B' if ii was ruling out airport expansion, and insisted that high speed rail was no substitute for adequate international air links. II said: 'Given that Heathrow is currently at 99 per cent capacity, this is one of the principal factors attecting the competitiveness of London.'
Business groups had long argued that the expansion of Heathrow, which was approved by the former Labour government, was critical to supporting the growth of London as an international financial centre. Frequent business travellers have regularly complained about 'Heathrow hassle' in recent years, typified by long queues in the wake of terror alerts, overcrowding and outdated facilities.
The expansion had been bitterly opposed by councils, residents and environmental groups. Both the Tories and Liberal Democrats had pledged to scrap the scheme in their manifestos. John Stewart, chairman of anti-Heathrow expansion group Hacan CleanSkies, said: 'The third runway is dead in the water. Residents under the flight path are delighted and people who stood lo lose their homes are relieved. It is also good for London as a whole as ii would have been bad for the environment and ii was not needed for the city's economic well-being.' Norman Baker, the Lib Dem MP who is an outspoken opponent of Heathrow expansion, said the move was 'the first fruit of the agreement' for people in London.
Source: Financial Times 2010

requires

Some impacts may be more tradeable in decision making than others. Sippe (1994) provides an illustration for both socio-economic and biophysical categories, of negotiable and non-negotiable impacts (Table 8.7). Sadler (I 996) identified such trade-offs as the core of decision- making for sustainable development.

In the UK, the most obvious decision that is influenced by the EIA process is the competent authority's planning approval decision. The EIS may inform a planning officer's report, a planning committee's decision, and modifications and con- ditions to the project before and after submis- sion. Kut the impact of EIA on decision-making may be much wider than this, influencing, for example, the alternatives under consideration, project design and redesign, and the range of mitigation measures and monitoring procedures (Glasson 1999). Indeed, the very presence of an effective EIA system may lead to the withdrawal of unsound projects and the deterrence of the initiation of environmentally damaging projects.

In Chapter 3 the various participants in the EIA process were identified. These participants will have varying perspectives on EIA in decision- making. A local planning officer may be concerned with the ce11trality of EIA in decision-making (does it make a difference?), central government might be concerned about consistency in application to development proposals across the country, and

whether they help to deliver s11staina/Jle developme11t in an efficient manner; pressure groups may also be concerned with these criteria, but also with fairness (in providing opportunities for participa- tion) and integration in the project cycle and approval process (to what extent is EIA easily bypassed?). A number of studies have attempted to determine whether EIA and associated consultations have inlluenced decisions about whether and how to authorize a project. Early surveys of local planning officers (Kobus and Lee 1993; Lee et al. 1994) suggested that EISs were important in the decision in about half of the cases. Interviews with a wider range of interest groups (DoE 1996) found that about 20 per cent of respondents felt that the EIS had 'much' influence on the decision, more than SO per cent felt that it had 'some' influence, and the remaining 20-30 per cent felt that it had little or no influence. Jones (1995) found that about one-third of planning officers, developers and public interest groups felt that the EIS intluenced the decision, compared with almost half of environmental consultants and only a very small proportion of consultees. For planning decisions, it is the members of the planning committees who make the final decision. Interviews suggest that they are not generally interested in reading the EIS, but instead rely on the officer's report to summarize the main issues (DoE 1996). According to Wood

Table B.7 Judging environmental acceptability - trade-offs

Non-negotiable impacts Negotiable impacts·

Ecological (physical and biological syslems componenls)

Human (humans as individuals or in social groupings)

- Degrades essential life support systems
- Degrades the conservation estate
- Adversely effects ecological integrity
- Loss of biodiversity
-

- Loss of human life
- Reduces public health and safety unacceptably
- Unreasonably degrades quality of life where people live

- No degradation beyond carrying capacity
- No degradation of productive systems
- Wise use of natural resources

- Community benefits and costs and where they are borne
- Reasonable apportionment of costs and benefits
- Reasonable apportionment of inter- generational equity
- Compatibility with defined environmental policy goals

Source: Sippe (1994)

- In terms of net environmental benefits

and Jones (1997), planning committees followed officers' recommendations in 97 per cent of the cases they studied. rhe consultations related to the EIS arc generally seen to be at least as important as the EIS itself (Jones 1995; Kobus and Lee 1993; Lee et al. 1994; Wood and Jones 1997). On the other hand, many non-statutory bodies feel excluded from the decision-making process, and one national non-statutory wildlife body com- plained that if a statutory consultee did not object, then their own objections went largely ignored (DoE 1996).

While studies of early E!Ss (e.g. Kobus and Lee 1993; Lee et al. 1994) suggested that material considerations were slightly more important than environmental considerations in the final deci- sion on a project's authorization, a later study (Jones 1995) suggested that the environment was the principal factor influencing the decision, with planning policies given slightly less weight. Wood and Jones (1997) reported that the environment was seen to be the overriding factor influencing the decisions in 37 per cent of the cases they studied. However, only in very few cases would the final decision have been different in the absence of an EIS. Weston's (2002) study of planning appeal cases concludes:

Procedurally EIA is much stronger today in the UK than it was in the early years of its implementation - yet the influence that EIA has on the actual decisions made by LPAs and planning inspectors remains weak, as those decisions are based on a complex web of factors that had evolved long before Eli\ was introduced ... Local authorities in England and Wales deal with around 450,000 applications for planning consent per year. The decisions on those applications arc made on the basis of 'material considerations' including the local development plan, national planning policy guidance and the results of a formal consultation process. EIA cases make up less than 0.1% of those appli- cations and for the most part the actual decision-making process for those cases will be little different to the other 99.9%.

Overall, then, in the UK project applications with E!Ss are not treated much differently from those without E!Ss. Although environmental issues are addressed more formally, in a discrete document, the final decision-making process is not changed much by EIA. The main procedural difference brought about by EIA is the need to consult people about the EIS, and the broader scope for public participation (not often used in practice) that it brings. The main substantive differences come in the form of modifications to projects and mitigation measures designed in early on, possibly additional or different conditions on the project, and generally a more comprehensive consideration of environmental issues by the competent authority.

A key driver behind recent improvements to ElA quality, including the 2011 ElA regulations and guidance, has been the threat of legal challenge, either on the basis that the project should have been subject to EIA but wasn't, or that the EIA process was inadequate. Legal challenges are important in that they interpret aspects of ElA legislation, set precedents for subsequent E!As and, over time, have tended to strengthen EIA require- ments. A consultant from a major environmental consultancy noted that:

'Recent case law has had a profound impact on our EIA work ... It's easy for objectors to criticise the EIA process on the basis of case law, to stand up at public inquiries and say the process has not been followed correctly. Scrutiny comes far more frequently and intensely than it used to, at least on the type of projects we're working on.' Mr Hewitt isn't pointing the linger at a single legal dispute that suddenly opened the floodgates to further legal challenges, rather he's arguing that the cumulative effect of El A-related case law has been to make the raising of objections easier ... Continuously referring back to case law in a bid to construct ESs that com- prehensively take account of all relevant legal judgments is a laborious process, but one that experienced clients have come to

and

view as a good investment, says Mr Hewitt. Anything that improves the chance of being granted planning approval and/or increasing the speed with which approval is granted is worth paying for. (ENDS Directory 2007)

This rather lengthy section reviews a selection of UK judicial review cases, to give the reader an idea of the kinds of issues that arise during such a legal challenge. It includes some of the key recent court cases that are triggering changes in UK EIA guidance (Baker, Mellor); key older cases that have influenced past guidance and subsequent court cases (Berkeley, Rochdale); and a few other cases that illustrate specific themes in EIA law. They are presented in the rough sequence within the EIA process in which the issue occurs, starting with the screening process and concluding with mitiga- tion. They include quite lengthy quotes from the legal judgements, to give a flavour of the logic and arguments used by the courts, and to show how EIA legislation is used and interpreted.

The UK courts system is complex, with multiple layers and players. For the purposes of this section, however, only limited information about the system and main players is needed. first, the claimant (the person or organization initiating the legal challenge, also known as the plaintiff or in some cases the appellant) must have 'standing' to bring a legal challenge, in that they must be sufficiently affected or harmed by the decision that they are challenging. Claimants in EIA cases are typically local residents affected by a planning decision to allow a project, or developers affected by a competent authority's decision to require EIA. The defendant is the person or organization against which the claimant is making the legal challenge. Finally, where a public authority's decision is being judicially reviewed - as is the case for all of the legal challenges presented in this section - the UK courts use the test of 'Wednesbury unreasonable- ness', which is based on a completely unrelated court decision of 1947 involving operation of a cinema. A decision is 'Wednesbury unreasonable' if it is so unreasonable that no reasonable authority could have decided that way.

8. 6. 1 Environmental assessment is required even if it would not change a planning decision

Berkeley vs. Secretary of State for the Environment and others (2000) UKHL 36;
(2000) 3 All ER 897; (2000) 3 WLR 420

The 'Berkeley l' case involved a 1994 planning application for redevelopment of the Fulham Football Club. The local planning authority did not ask for an EIS (and none was prepared), but it did consult with a wide range of organizations, and carefully weighed up the advantages and

disadvan- tages of the proposed scheme. In August 1995, the Secretary of State called in the application. He also did not require an EIS. He granted permission in August 1996.
Lady Berkeley, who lived near the site, chal- lenged this planning permission, arguing that an EIA should have been carried out. Iler appeal was dismissed, with the judge agreeing with the football club that upon the true construction of the regulations, no EIA was required. The judge also noted that, even if an EIA had been required, in his opinion the absence of the EIA 'had no effect on the outcome of the inquiry and could not possibly have done so'. A Court of Appeal decision of 1998 found that the judge was wrong to determine that no EIA was required, but upheld his decision on the basis of the EIA's lack of effect on the outcome of the inquiry. Lady Berkeley challenged the Court of Appeal decision, and the 'Berkeley 2' case came before the I louse of Lords in 2000.
The counsel for the Secretary of State this time accepted that the fact that an EIA would have made no difference to the outcome of a planning decision is not a sufficient reason for the courts not to quash that decision. Instead he argued that there had been substantial compliance with the requirements of the Directive.
The House of Lords concluded first that redevelopment of the football club could arguably be considered an 'urban development project' within paragraph lO(b) of Schedule 2; that its effect on ecology of the River Thames meant that it was likely to have significant environmental effects; and that in these circumstances individuals affected by the proposed development had a directly enforceable right to have the need for an EIA
considered by the Secretary of State prior to him granting planning permission and not afterwards by a judge.
It also ruled that the EIA process goes beyond simply informing a planning decision, and so matters even if the EIA would not have changed the decision:

The directly enforceable right of the citizen which is accorded by the Directive is not merely a right to a fully informed decision on the substantive issue. It must have been adopted on an appropriate basis and that requires the inclusive and democratic procedure prescribed by the Directive in which the public, howevu misguided or wrongheaded its views may be, is given an opportunity to express its opinion on the environmental issues.
It also dismissed the Secretary of State's argument that an equivalent of an EIS had been prepared:

[The Secretary of State's counsel] says that the equivalent of the applicant's environ- mental statement can be found in its state- ment of case under the Inquiry Procedure Rules, read (by virtue of cross-referencing) with the planning authority's statement of case, which in turn incorporated the com- prehensive officers' report to the planning sub-committee, which in turn incorporated the background papers such as the letters from the National Rivers Authority and the London Ecology Unit and was supplemented by the proofs of evidence made available at the inquiry. Members of the public had access to all these documents and the right to express their opinions upon them at the inquiry ... I do not accept that this paper chase can be treated as the equivalent of an environmental statement ... The point about the environ- mental statement contemplated by the Direc- tive is that it constitutes a single and accessible compilation, produced by the applicant at the very start of the application process, of the relevant environmental information and the summary in non-technical language.
The planning permission was quashed.

R on the application of Lebus vs. South Cambridgeshire DC (2003) 1
The 'Lebus case' concerned a February 2000 planning application for an egg production unit for 12,000 free range chickens in a 1,180 m2 building, and an associated dwelling for an agricultural worker. In April 2000, the claimants' solicitor wrote to South Cambridgeshire District Council claiming that the application required an EIA. The planning officer wrote back promptly, noting that the proposal did not require EIA under Schedule 1 of the 1999 EIA regulations since it housed less than 60,000 hens, but that it was a Schedule 2 proposal as the building would be more than 500 m2• However the planning officer also noted that:
consideration has to be given to each pro- posal on whether it would have significant effects on the environment by virtue of fac- tors such as its location, impact, nature and size ... When considering the need for an Environmental Assessment the above factors as well as issues such as: Airborne pollution; Dirty water and litter disposal; Ecology; Highways and access; and Landscape were taken into account. The Council did not wish to be drawn into requesting an Environ- mental Statement purely to get information it should rightfully expect anyway. It was considered all the above points could be covered in sufficient detail without formally requesting an Environmental Statement.
South Cambridgeshire granted planning permis- sion in January 2002.
Justice Sullivan concluded that the local authority had not prepared any document that could be sensibly described as a screening opinion for the project. He then also noted that:

in so far as the statutory question was addressed, it was addressed upon the basis that planning conditions would be imposed and management obligations would be enforceable under section 106. The question was not asked whether the development as

considered by the

described in the application would have significant environmental effects, but rather whether the development as described in the application subject to certain mitigation measures would have significant environ- mental effects ... the underlying purpose of the Regulations in implementing the Directive is that the potentially significant impacts of a development arc described together with a description of the measures envisaged to prevent, reduce and, where possible, offset any significant adverse effects on the environment. Thus the public is en- gaged in the process of assessing the efficacy of any mitigation measures. It is not appro- priate for a person charged with making a screening opinion to start from the premise that although there may be significant im- pacts, these can be reduced to insignificance as a result of the implementation of condi- tions of various kinds. The appropriate course in such a case is to require an environmental statement setting out the significant impacts and the measures which it is said will reduce their significance.

Similar considerations applied in Bellway Urban Renewal Southern vs. John Gillespie [2003] EWCA Civ 400, where the Secretary of State gave permission for the redevelopment of a former gasworks into residential units, on the basis that the scheme would bring a contaminated site back into beneficial use, and that decontamination of the site could be secured through a planning condition. The claimant successfully argued that the Secretary of State had not considered the project's unmitigated effects, but rather had inappropriately assessed the effects only assuming that mitigation had been put in place.
These cases do not suggest that remediation measures must be totally ignored when decisions are made about the likely significant effects of a proposed development, but they do suggest that care and judgement has to be exercised. Well- established and uncontroversial remedial measures may well be taken into account, but for more complex projects, or where the proposed remedia- tion measures are complex or less well understood, this may be less appropriate. Furthermore, the offer of remediation measures should not be used to
frustrate the purpose of the EIA Directive or substitute for its requirements.

R oao Baker vs. Bath and North East Somerset Council ((2009] EWHC 595)2
lhc 'Baker case' involved a 2005 application by Hinton Organics (Wessex) Limited for an extension to a 2.1 ha composting site called Charlton Fields, which it had been operating since 2000. The application was to compost wood waste and card- board, as well as green waste, at Charlton Fields, and to expand operations to another smaller (less than 0.5 ha) site about 1 kilometre away from Charlton Fields, named Lime Kiln. Partly com- posted waste from Charlton Fields would be trans- ported to Lime Kiln, where the composting process would finish. The planning authority granted planning permission in 2006 without requiring ElA. This was challenged by the plaintiff.
The planning authority argued that no ElA was required for the Lime Kiln application because of the wording of the Town and Country Planning (Environmental Impact Assessment (England and Wales) Regulations 1999 that required EIA for 'Any change to or extension of development listed in this Schedule where such a change or extension meets the thresholds, if any, or descrip- tion of development set out in this Schedule.' The relevant schedule for the disposal of waste included as thresholds: '(ii) the area of the development exceeds 0.5 of a hectare ... the thresholds and criteria ... applied to the change or extension (and not to the development as changed or extended).' Mr Justice Collins ruled in favour of the plaintiff. Referring to two European court cases -
described in the application would have
significant environmental effects, but rather
whether, notwithstanding the threshold had not been crossed, it was, indeed, an EIA devel- opment, whether or not it was to be regarded as cumulative ...
I have come to the conclusion that the regulations do not in the passage in paren- thesis ['(and not to the development as changed or extended)'] properly implement the Directive. This is because they seek to limit consideration for the purposes of screen- ing to consideration of the change or exten- sion on its own. That is, in my view, contrary to the purpose of and the language of the Directive and the approach that should be adopted as set out by the court.
As a result of this ruling, the UK government is now applying the thresholds in Schedule 2.13 to the whole of the development once modified, and not just to the change or extension; and has added a new provision that will require any change or extension to an existing or approved

Schedule l project to be screened for the need for EIA (DCLG 201 la).
A similar early EIA case, R. vs. Swale BC exp RSPB [1991] 1 PLR 6, 16, concerned the construction of a storage area for cargo that would require the infill of Lappe! Bank, a mudflat important for its wading birds. Justice Simon Brown concluded that:
The proposals should not then be considered in isolation if, in reality, it is properly to be regarded as an integral part of an inevitably more substantial development. This approach appears to me appropriate to the language of the Regulations, the existence of the smaller development of itself promoting the larger development and thereby likely to carry in its wake the environmental effects of the latter ... developers could otherwise defeat the object of the Regulations by piecemeal development proposals.

R (SAVE Britain's Heritage) vs. Secretary of State for Communities and Local Government, (2011) EWCA Civ 3343
The 'SAVE case' involved a decision by Lancaster City Council to permit the demolition of the historic Mitchell's Brewery building without requiring an EIA. Both parties agreed that the demolition would have a significant impact on cultural heritage. In May 2010, the High Court ruled that demolition was not a 'project' within the scope of the ElA Directive and so did not require EIA. The pressure group SAVE Britain's Heritage took the case to the Court of Appeals. In a judgement of March 2011 that reflected the recent case of Commission vs. Ireland C-50/09, Lord Justices Toulson and Sullivan took as a basis the EIA Directive's definition of 'project', namely:

- the execution of construction works or of other installations or schemes,
- other interventions in the natural sur- roundings and landscape including those involving the extraction of mineral resources 8.6.5
Need for a screening statement where a project is 'screened out' 8.6.6
EIA may be required at the detailed consent stage even if it was not required at the outline consent stage

8.6.7
EIA for outline planning applications and in other cases where there is uncertainty about the project

... (Article 1.2).
[The defendant] readily accepted the proposition that the Directive must be inter- preted in a purposive manner. If it is accepted that works are capable of having significant effects on the environment, the definition of 'project' in Article 1.2 should, if possible, be construed so as to include, rather than exclude, such works. Applying this approach to the first limb of the definition in Article 1.2, it seems to me that the execution of demolition works falls naturally within 'the execution of ... other ... schemes' ... [But] it is unnecessary to give Article 1.2 a broad and purposive construction in order to reach the conclusion that, in ordinary language, demolition works which leave a site on completion in a condition which protects the public and preserves public amenity are capable of being a 'scheme' for the purposes of Article 1.2 ... whether, notwithstanding the threshold had
not
!The defendant] submitted that demolition could not fall within the Directive, even if it fell within the definition of project in Article 1.2, because it was not included in the lists of projects in Annexes I and II to the Directive. !But] the lists of projects include 'projects' that do not necessarily involve construction works; sec cg. the list of 'Agri- culture, silviculturc and aquaculture' pro- jects, and some of the 'Food Industry' projects.
!The Commission vs. Ireland C-50/09 case concluded] that the Annexes refer to sectoral categories of projects, and do not describe the precise nature of the works which may comprise such a project. If demolition is capable of being a 'scheme' for the purposes of Article 1.2, it is also capable of being an 'urban development project' within para- graph 10 (bl of Annex II, even though the project comprises only demolition and restor- ation of the site.

R vs. Secretary of State for the Environment, Transport and Regions and Parcelforce ex parte Marson [1998] EWHC Admin 351 :4 and
R oao Mellor and Secretary of State for Communities and Local Government [2010] Env LR 25
The 'Marson case' involved a 1996 planning application by Parcelforce to develop a 1 7 hectare site near Coventry Airport for sorting and handling of parcels. A group of local residents and parish councils sought a direction from the Secretary of State that environmental assessment was required. In a letter of February 1998, the Secretary of State noted that the development fell within lO(a) of Schedule 2, but would not be likely to have significant environmental effects, and that no EIA would be required. The applicants challenged this decision, suggesting that reasons must be given for declining to require an EIA. Lord Justices Nourse, Pill and Mummery comprehensively disagreed, citing inter a/in the lack of a stated legal duty to do so, the discretion afforded to the Secretary of State, the applicant's opportunity to influence the planning process through other means.
This finding held for many years, but has recently been called into question by the 'Mellor case'. The Mellor Case involved a 2004 planning application by Partnerships in Care (l'IC) for a medium secure hospital at HSM Forest Moor. In July 2006, PIC's consultants asked Harrogate Horough Council for a screening opinion. Nearby residents, including Mr Mellor, wrote to the council arguing that an EIA was needed, and in October the council determined that an EIA was required. l'IC referred the matter to the Secretary of State, who decided in December 2006 that EIA was not required.
The matter was referred to the European Court of Justice. There, Advocate General Kokott concluded that, although the EIA Directive does not require a negative screening opinion to include reasons, third parties should be able to satisfy themselves that the competent authority has come to its determination in a legal robust manner. In sum, she determined that (1) a negative screening opinion does not need to contain reasons; but (2) the planning authority has a duty to provide further information and relevant documents on the negative screening decision if this is requested by an interested party; but in turn that (3) further information can be brief and does not have to be formal. These requirements are are also included in recent changes to UK EIA regulations (DCLG 2011a).

R oao Diane Barker vs. LB Bromley, C-290/03, [2007] Env LR 2
The 'Barker case' involves a two-stage planning application by London & Regional Properties Ltd for first outline and then detailed consent to develop a leisure complex in Crystal Palace Park. The London Borough of Bromley did not require an EIS for the first application, and granted outline planning consent in March 1998, reserving certain matters for subsequent approval before develop- ment started. The developer applied to the council for final determination of these reserved matters in January 1999, and the council issued a notice of approval in May 1999.
A nearby resident, Ms Barker, challenged the second permission and ended up bringing her challenge to the European Court of Justice. Broadly the challenge can be boiled down to the question: if a UK planning authority has decided that EIA is not required at the outline planning permission stage because they believe that the project would not have significant environmental effects, and if at the detailed planning permission stage it emerges that the project could have significant environ- mental effects, can and must they the planning authority require EIA at the detailed stage? Note that there is a distinction between 'can' and 'must', since LB Bromley argued that UK national legis- lation did not allow them to do this even if they had wanted to do it.
Advocate General Leger ruled in favour of Ms Barker:

Article 1 (21 of Directive 85/337 defines 'development consent' for the purposes of the directive as the decision of the competent authority or authorities which entitles the developer to proceed with the project. It is apparent from the scheme and the objectives of Directive 85/337 that this provision refers to the decision (involving one or more stages) which allows the developer to commence the works for carrying out his project. Having regard to those points, it is therefore the task of the national court to verify whether the outline planning permission and decision approving reserved matters which are at issue in the main proceedings constitute, as a whole, a 'development consent' for the purposes of Directive 85/337 ...
IW]here national law provides for a consent procedure comprising more than one stage, one involving a principal decision and the other involving an implementing decision which cannot extend beyond the parameters set by the principal decision, the effects which a project may have on the environment must be identified and assessed at the time of the procedure relating to the principal decision. It is only if those effects are not identifiable until the time of the procedure relating to the implementing decision that the assessment should be carried out in the

course of that procedure. [In such
a legal context] it follows that the competent authority is, in some circumstances, obliged to carry out an environmental impact assessment in respect of a project even after the grant of outline planning permission, when the reserved matters are subsequently approved ... This assessment must be of a comprehensive nature, so as to relate to all the aspects of the project which have not yet been assessed or which require a fresh assessment.
ISo] Articles 2 (1) and 4 (2) of Directive
85/337 are to be interpreted as requiring an environmental impact assessment to be carried out if, in the case of grant of consent comprising more than one stage, it becomes apparent, in the course of the second stage, that the project is likely to have significant effects on the environment by virtue inter a/ia of its nature, size or location.

The UK government changed the Town and County Planning (EIA) (England) Regulations in 2008 to reflect these points (DCLG 2010).

The 'Rochdale envelope'

rwo legal challenges to planning permissions by Rochdale Metropolitan Borough Council have established the concept of the 'Rochdale envelope'.
R vs. Rochdale Metropolitan Borough Council ex parte Tew and others (1999)6 - 'Rochdale 1' - concerned an outline planning application made in early 1999 by Wilson Bowden Properties Limited and English Partnership for a 213 hectare business park. Rochdale MBC had a long-standing policy that the area should be developed as a business park. The planning application was accompanied by an indicative land use schedule and floor space figures, and the accompanying letter noted that 'The master plan has been prepared for illustrative purposes ... [It] aims to demonstrate the general form of development, showing the integration of the access proposals, principal highways alignment, and possible patterns of land use ... ' Rochdale
MBC gave planning perm1ss1on for the project subject to a range of conditions, including

- Condition 1.3: 'The development shall be carried out in accordance with the mitigation measures set out in the Environmental Statement submitted with the application, unless otherwise agreed in writing by the Local Planning Authority ... '

- Condition 1.7: 'No development shall be commenced until a scheme (the Framework Document) has been submitted to and approved by the Local Planning Authority showing the overall design and layout of the proposed Business Park, including details of the phasing of development and the timescale of that phasing. The Framework Document shall show details of the type and disposition of development and the provi- sion of structural landscaping within and on the perimeters of the site. The Business Park shall be constructed in accordance with the approved Framework Document unless the Local Planning Authority consents in writing to a variation or variations.'

- Condition 1.11: 'This permission shall not be construed as giving any approval to the illustrative Masterplan accompanying the application.' I.
11 explains that the Masterplan was sub- mitted for illustrative purposes only and that it gave insufficient detail on which to deter- mine the layout of the site. If it was inade- quate for that purpose, it is difficult to see how it could have been an adequate descrip- tion for the purposes of paragraph 2(a) of

The plaintiffs argued that the EIS was inade- quate because it did not provide adequate information as to the 'design and size or scale of the project', and that this information was necessary to identify the proposed development's main environmental effects. They also argued that, not only was the outline planning permission not tied to the illustrative masterplan on which the EIS was based, but that it expressly envisaged that a different layout and composition of users would emerge as part of the development of the Frame- work Document. They argued that a planning decision for an EIA project must be taken in the full knowledge of the project's likely environ- mental effects, and that it is not sufficient that full knowledge will be obtainable at

a later stage.
The council, in turn, argued that the kind of detailed requirements envisaged by the plaintiffs would make it difficult, and possibly completely impractical, to seek planning permission for large projects; and that Circular 15/88 expressly allowed outline planning permission to be sought for projects requiring EIA. Justice Sullivan, however, agreed with the plaintiffs in a judgement of May 1999:

Condition 1.3 ... tics the mitigation meas- ures to the Environmental Statement (unless otherwise agreed), but those measures were a response to the environmental impacts of development in accordance with the illus- trative Masterplan. Recognising, as I do, the utility of the outline application procedure for projects such as this, I would not wish to rule out the adoption of a Masterplan approach, provided the Masterplan was tied, for example by the imposition of condition, to the description of the development permitted. If illustrative floor space or hectar- age figures arc given, it may be appropriate for an Environmental Assessment to assess the impact of a range of possible figures before describing the likely significant effects. Conditions may then be imposed to ensure that any permitted development keeps within those ranges.
The fundamental difficulty in the present case is that ... the outline planning per- mission was not tied in any way to either of those documents. Conditions 1.7 and 1.11 dispensed with the :viasterplan and replaced it with the framework Document to be submitted and approved in due course. The reason given for the imposition of condition
Schedule :1 to the Assessment Regulations.

The Rochdale saga promptly continued as 'Rochdale 2', R vs. Rochdale Metropolitan Borough Council ex parte Milne (2000).7 After the results of Rochdale I, the developers re-applied for outline planning permission for the business park, including a schedule of development, development framework and masterplan. Details of landscape and design were reserved (not provided), as were transport arrangements for most of the plots on the site. rhe planning application was accompa- nied by a comprehensive EIS.
Rochdale MBC again gave planning permission for the proposal in December 1999, but this time the planning conditions were much more closely tied to the EIS. For instance Condition 1.7 stated that:
'The development on this site shall be carried out in substantial accordance with the layout included within the Development Framework document', because 'The layout of the pro- posed Business Park is the subject of an Environmental Impact Assessment and any material alteration to the layout may have an impact which has not been assessed by that process.'
Condition 1.11 required that 'The development shall be carried out in accordance with the miti- gation measures set out in the Environmental Statement submitted with the application unless provided for in any other condition attached to this permission.'
The plaintiff again challenged the planning permission, arguing that, despite the changes made to the planning application, it still did not provide 'a description of the development proposed'. The reserved matters - design and access arrangements
-
could significantly affect the environmental impacts of the project, for instance by the materials used or whether the development included a particularly striking 'landmark' building. He sug- gested that, to comply with the requirements of Schedule 3, the development must be described in enough detail to ensure that nothing is omitted that may be capable of having a significant envir- onmental effect; and that outline planning applica- tions are thus fundamentally inconsistent with the requirement for EIA. In this case, Justice Sullivan sided with the local authority and dis- missed the application for judicial review:

If a particular kind of project, such as an industrial estate development project ... is, by its very nature, not fixed at the outset, but is expected to evolve over a number of years depending on market demand, there is no reason why 'a description of the project' for the purposes of the directive should not recognize that reality. What is important is that the environmental assessment process should then take full account at the outset of the implications for the environment of this need for an element of flexibility ... It is for the authority responsible for granting the development consent ... to decide whether the difficulties and uncertainties arc such that the proposed degree of flexibility is not accept- able in terms of its potential effect on the environment.
Any major development project will be subject to a number of detailed controls, not all of them included within the planning permission. Emissions to air, discharges into water, disposal of the waste produced by the project, will all be subject to controls under legislation dealing with environmental pro- tection. In assessing the likely significant environmental effects of a

project the authors of the environmental statement and the local planning authority are entitled to rely on the operation of those controls with a reason- able degree of competence on the part of the responsible authority ... The same approach should be adopted to the local planning authority's power to approve reserved matters.

The Rochdale judgements have significant implications for outline planning applications and for cases where there is uncertainty about details of the proposed project:

- Applications for 'bare' outline permissions with all matters reserved for later approval are very unlikely to comply with ElA requirements.

- Developers can have flexibility, but for EIA purposes they need to consider the range of possible parameters within which the project might evolve, and these must be detailed enough to allow a proper assessment of the likely environmental effects and proposed mitigation.

- The flexibility should not be abused, and does not give developers an excuse to provide inadequate descriptions of their projects. The planning authority must satisfy itself that, given the nature of the project, it has 'full knowledge' of its likely environmental effects.

- The outline planning application should specify clearly defined parameters within which the project may evolve, in the form of conditions and obligations. These should be 'tied' to the environmental information of the ES - the range of these parameters is the 'Rochdale envelope'.

- Implementation of reserved matters consents granted for matters that are not in the outline consent will be unlawful (IPC 2011). 8.6.8
 Themes in judicial review findings

Until recently, judicial reviews of competent authority decisions have been limited by the courts' relatively narrow interpretation of the duties of competent authorities under the EIA regulations. However, a series of high-profile recent cases - including Baker, Mellor, Barker and SAVE
-
 suggests that the courts are now taking a more proactive and wider view of the EIA Directive's requirements. Several conclusions can be drawn from these legal judgements:

- The EIA Directive is interpreted by the courts as having a 'wide scope and broad purpose', in line with the Kraaijveld (Dutch Dykes) Case C- 72/95.

- A project cannot be automatically excluded

- The imposition of planning conditions to the point where the project would no longer have significant environmental impacts is also not equivalent to EIA. The distinction between EIA screening (not including mitigation) and impact assessment (which can include miti- gation) is important. 'A purposive approach might be as follows. Would an open minded adviser to the competent authority or mem- ber of the public concerned about the poten- tial [significant environmental effect] want the systematic assembly of the EIA data to judge how effective the proposed [mitigation measure) would be? If so EIA is required' (McCracken 2010).

8. 7 Costs and benefits of EIA

Much of the early resistance to the imposition of EIA was based on the idea that it would cause additional expense and delay in the planning process. EIA proponents refuted this by claiming that the benefits of EIA would well outweigh its costs. This chapter concludes with a discussion of the costs and benefits of EIA to various parties in the UK.

from EIA requirements simply because it is not 8_7_1 Costs of EIA

listed in the E!J\ Directive or implementing

regulations. Furthermore, because projects can be described in different ways, for EIA screening purposes it is probably better to consider the project's scope and purpose rather than its label.

- Where aspects of a project are uncertain, the

EIA must provide enough information to allow a decision to be made taking into account these uncertainties.

- Provision of information equivalent to that in

an EIS is not equivalent to EIA, since the public participation requirements of EIA are also important.

- The courts have clarified that EISs do not have to consider alternatives, even if the plan- 8.8 Summary 1

Reviewing the nature of UK EIS activity displayed in Figures 8.1 and 8.2, how might you explain the changing patterns of activity?

2

What might explain the changes in the predominant sectors of UK EIS activity since 2000, compared with before 2000, as set out in Figure 8.3?

3

From Table 8.2, are there any indications of notable differences in approaches to screening in relation to amount of practitioner EIA experience?

4

Compare and contrast the information in Tables 8.4 and 8.5. Identify and seek to explain any differences in content in relation to the importance of various environmental components in EIA scoping activity.

5

Given the information from Section 8.4.3 about determinants of EIS quality, if you were managing an Eli\ process for the first time, how would you try to optimize the quality of the resulting EIS?

6

Using the third runway at Heathrow (Box 8.1) as an example, what do you think are negotiable and non-negotiable impacts of an airport (Table 8.7)?

7

Do you agree with the judge in the Berkeley case (Section 8.6.1) who felt that no EIA should be required where the absence of an EIA would have 'no effect on the outcome of the inquiry and could not possibly have done so'? Why or why not?

8

In your words, what is the 'Rochdale envelope' (Section 8.6.7) and why is it important for EIA practice?

9

Section 8.7 suggests that the costs of EIA can be quantified, but its benefits cannot. How could you determine whether the costs of an EIA outweigh its benefits? Do you think that they do?

ning authority thinks that they should have been considered or if the alternatives would have a less severe impact than the proposed project.
Environmental impact assessment has slightly increased the cost to developers of obtaining planning permission. An EIS generally costs between 0.01 and 5 per cent of project costs, with 0.1 to 1 per cent being a rough average for the UK (GHK 2010). Weston's (1995) survey of consultants showed that consultancies received on average
£.34,000 for preparing a whole EIS, £40,000 for several EIS sections, and £14,750 for one section: this itself highlights the variability of the costs involved. In 1997, the (former) DETR suggested
£35,000 as a median figure for the cost of undertaking an EIA (DETR 1997b), and in 2010 DCLG suggested an average cost of almost £90,000 (€100,000): it is unclear whether this difference is due to a strong rise in the actual costs of ElA, or to some other factor.
There has been some concern that competition and cost-cutting by consultancies, an increase in 'cowboy' consultancies and the tendency for developers to accept the lowest bid for preparing an EIS may affect the quality of the resulting EIAs by limiting the consultants' time, expertise or equipment. Consultants note that 'on all but the largest developments there is always a limited budget- an EA expands to fill the available budget, and then some' (Radcliff and Edward-Jones 1995). However, Fuller (1992) argued that cost-cutting may not be helpful to a developer in the long run:

A poor-quality statement is often a major contributory factor to delays in the system, as additional information has to be sought on issues not addressed, or only poorly addressed, in the original ... Therefore reduc- ing the cost of an environmental assessment below the level required for a thorough job is often a false economy.

The cost of EIA to competent authorities is much more difficult to measure and has until now been based on interviews rather than on a more systematic methodology. UK planning decisions for the kinds of large projects that require EIA have always taken a long time, often years. They con- sistently take considerably more time than do decisions for projects that do not require EIA (DoE 1996), but then they tend to be larger, more complex and more politically sensitive. i\n early study (Lee and Brown 1992) found that about half the planning officers interviewed felt that the EIS had not influenced how long it took to reach a decision; the rest were about evenly split between those who felt that the EIA had speeded up or slowed down the process. In later interviews (DoE 1996), many planning officers felt that dealing with the EIS and the planning application were one and the same, and 'just part of the job'. Estimates for reviewing the EIS and associated consultation ranged from 5 hours to 6-8 months of staff time! Planning officers handling EIS cases tend to be development control team leaders and above, so staff costs would generally be higher than for standard planning applications. In some cases, planning officers also hire consultants to help them review and comment on EISs, adding to their costs.
The time taken to decide planning applications has recently been the focus of several studies (e.g.
National Audit Office 2008; DCLG 2008; Ball et al. 2008), none of which identified EIA as a factor leading to delays. Only Killian Pretty's 170 page review of planning applications (DCLG 2008) mentioned EIA at all, and then only very briefly to imply that their length should be shortened. Some consultants feel that EIA slows down the decision-making process and is a means through which LPAs can make unreasonable demands on developers to provide detailed information on issues 'which are not strictly relevant to the planning decision' (Weston 1995). However others feel that Eli\ does not necessarily slow things down: 'The more organised approach makes it more efficient and in some cases it allows issues to be picked up earlier. rhe EIS can thus speed up the system' (DoE 1996).
The Planning Act 2008, the primary aim of which was to speed up the planning system, set up a new system of National Policy Statements to provide policy guidance on energy, transport, water, wastewater and waste developments. It also established a parallel decision-making stream for major infrastructure projects, to help speed up their delivery. Early indications are that the pre- application stage - including preparation of EISs - for these projects is lengthening; it is not yet clear whether the government's aim of then deciding on the projects within a year of application will be met in practice (see also Section 3.5.7).
In 20 case studies, the time spent by co11s11/tees

on EIA ranged from four hours to one-and-a-half days for statutory consultees, and from one hour to two weeks for non-statutory consultees. Although some consultees, like planning officers, argued that 'this is what we are here for', others suggested that they needed to prioritize what developments they got involved in because of time and resource constraints (DoE 1996). This may well be even more of a problem in today's more straightened circumstances.

8.7.2 Benefits of EIA

The benefits of EIA are mostly unquantifiable, so a direct comparison with the costs of EIA is not possible. Perhaps the clearest way to gauge whether EIA helps to reduce a project's environmental impacts is to determine whether a project was modified as a result of EIA. Early studies on EIA effectiveness (e.g. Kobus and Lee 1993; Tarling 1991;Jones 1995) showed that modifications to the project as a result of the EIA process were required in almost half the cases, with most modifications regarded as significant. More recently, the European Commission (2009) reported that EIAs led to improvements for most projects, although this was based on information from Member States other than the UK.

Environmental impact assessment can have other benefits in addition to project modification. A survey of environmental consultants (Weston 1995) showed that about three-quarters of them felt that EIA had brought about at least some improvements in environmental protection, primarily through the incorporation of mitigation measures early in project design and the higher regard given to environmental issues. However, other consultants felt that the system is 'often a sham with EISs full of platitudes' (Weston 1995), and some developers felt that 'the preparation of the ES had cost them too much time and money, and that the large amounts of work involved in EA often yielded few tangible benefits in terms of the actual planning decision reached' (Pritchard et al. 1995). Jones et al. (1998) found that only one-fifth of developers and consultants felt that there had been no benefits associated with EIA. Presumably this view has not significantly changed in the interim.

Competent authorities generally feel that projects and the environment benefit greatly from El/\ (Jones 1995; Lee et al. 1994). EIA is seen as a way to focus the mind, highlight important issues, reduce uncertainty, consider environmental im- pacts in a systematic manner, save time by remov- ing the need for planning officers to collect the information themselves, and identify problems early and direct them to the right people (DoE 1996; Jones 1995; Pritchard et al. 1995; Weston 2002). One planning officer noted: 'when the system first appeared I was rather sceptical because I believed we had always taken all these matters into account. Now I am a big fan of the process. It enables me to focus on the detail of individual aspects at an early stage' (DoE 1996).

Consultees broadly agree that EIA creates a more structured approach to handling planning applica- tions, and that an EIS gives them 'something to work from rather than having to dig around for information ourselves'. However, when issues are not covered in the EIS, consultees are left in the same position as with non-EIA applications: some of their objections are not because the impacts are bad but because they have not been given any information on the impacts or any explanation of why a particular impact has been left out of the assessment. Consultees feel that an EIA can give them data on sites that they would not otherwise be able to afford to collect themselves, and that it can help parties involved in an otherwise too often confrontational planning system to reach common ground (DoE 1996).

In summary, all the parties involved agree that EIA as practised in the UK helps to improve projects and protect the environment, although the system could be much stronger: EIA is thus at least partly achieving its main aims. There are time and money costs involved, but there are also tangible benefits in the form of project modifications and more informed decision-making. When asked whether EIA was a net benefit or cost, 'the over- whelming response from both planning officers and developers/consultants was that it had been a benefit. Only a small percentage of both respon- dents felt that EIA had been a drawback' (Jones 1995).

Some stages in EIA - particularly early scoping, good consultation of all the relevant parties, and the preparation of a clear and unbiased EIS - are consistently cited as leading to clear benefits and cost-effectiveness (e.g. DoE 1996; !EMA 2011). Chapter 9 provides a set of primarily UK case studies that seek to exemplify some of the issues of and responses to particular aspects of the EIA process. Suggestions for future directions in EIA in the UK and beyond are discussed in Chapter 12.

SOME QUESTIONS

The followi11g questions are intended to help the reader focus 011 the key ismes of' this chapter.

3
Notes 4
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g Case studies of EIA 1n practice

This chapter builds on the analysis in Chapter 8 by examining a number of case studies of EIA in practice. The selected case studies mainly involve ElA at the project level, although examples of SEA are also included. Links between EIA and other types of assessment are also examined, including a case study of the 'appropriate assessment' process required under the European Union Habitats Directive and an example of health impact assessment. The selected case studies are largely UK-based and cover a wide range of project and development types, including energy (offshore wind energy, gas-fired power stations and overhead electricity transmission lines), transport (road projects and airports), waste (municipal waste incinerator and wastewater treatment works) and other infrastructure projects (port development and flood defence works). The case studies have been selected to illustrate particular themes or issues relevant to EIA practice, and some are linked to specific stages of the EIA process. These are:

- project definition in EIA and the effect of divided consent procedures on EIA (Wilton power station, Section 9.2);

- ElA, European protected habitats and appro- priate assessment (N21 link road, Section 9.3);

approaches to public participation in EIA (Portsmouth incinerator, Section 9.4);

- assessment of cumulative impacts (Humber Estuary schemes, Section 9.5);
- health impact assessment (Stansted airport second runway, Section 9.6);
- mitigation in EIA (Cairngorm mountain railway, Section 9.7);
- SEA at the national level (UK offshore wind energy development, Section 9.8); and
- SEA at the local level (Tyne and Wear local transport plan, Section 9.9).

9.2 Wilton power station case study: project definition in EIA

9.2.1 Introduction

9.2.2 The Wilton power station project

It is not claimed that the selected case studies represent examples of best EIA practice - indeed two of the cases were the subject of formal com- plaints to the European Commission regarding the inadequate assessment of environmental impacts. I lowever, the examples do include some innovative or novel approaches towards particular issues, such as towards the assessment of cumulative effects (Humber Estuary) and the treatment of public participation and risk communication (Portsmouth incinerator). The case studies also draw attention to some of the practical difficulties encountered in EIA, the limitations of the process in practice, plus opportunities for the future. This reinforces some of the criticisms of UK EIA practice made in Chapter 8, and pre-empts new directions identified in Chapters 11 and 12.

This chapter builds on

The selected case studies are largely based on original research either by the authors or by colleagues in the IAU at Oxford Brookes University (the exception is the power station case study in Section 9.2, which was researched by William Sheate, Reader in Environmental Assessment at Imperial College, University of London, and published in 1995).

This case study, originally documented by Sheate (1995), illustrates the problems of project definition in EIA, particularly in cases in which consent procedures for different elements of an overall scheme are divided. The case highlights the failure of the EIA process to fully assess the impacts of a proposed UK power station development. In particular, the EIA process failed to identify prior to the power station consent decision the environ- mental implications of the extensive electricity transmission lines required to service the new development.
The case study highlights a basic problem within EIA for UK energy sector projects caused by the splitting of consent procedures for electricity generation and transmission. This situation arose after the privatization of the UK electricity supply industry by the 1989 Electricity Act. The case illustrates how the division of consent procedures for individual components of the same overall project can result in conflicts with the EIA Directive's requirement to assess the direct, indirect and secondary effects of development projects. Although the case study relates to early EIA practice in the UK and EU (in the early 1990s), the issues raised remain largely unresolved and are still relevant to current practice in the UK and elsewhere.

Early in 1991, newspaper reports began to identify the environmental consequences of proposed high-voltage electricity transmission lines necessary to connect a new power station on Teesside, northeast England, to the National Grid system. To many, it was astonishing that these impacts had not been identified at the time the power station itself was proposed. Close inspection of the environmental statement (ES) produced for the power station revealed that such issues had barely been identi- fied at the time and therefore did not feature in the consent process for the power station. Follow- ing considerable public uproar over the proposed power lines, in April 1991 the Council for the Protection of Rural England (CPRE) lodged a formal complaint with the European Commission (EC) in Brussels against the UK Secretary of State for Energy (Sheate 1995).

This state of affairs could hardly be regarded as an example of good ElA practice, but how did it come about? The complaint concerned the EIA for a large new gas-fired power station at Wilton, near Middlesbrough on Teesside, proposed by Teesside Power Limited. CPRE argued that consent had been granted for the power station without the full environmental impacts of the proposal having been considered. Because of its size (1875 MW), the power station was an Annex I project and EIA was mandatory. However, the overall 'project' consisted of a number of linked components, in addition to the power station itself, including:

- a new natural gas pipeline;
- a gas reception and processing facility;
- a combined heat and power (CHP) fuel pipe- line from the processing facility to the CHP facility; and
- new 400 kV overhead transmission lines and system upgrades (75-85 km in length, running from the power station site to Shipton, near York).

It was the implications of the transmission connections required to service the new power station that were of particular concern, although the other project components also had the potential for environmental impacts. Cleveland County Council (CC), in whose area the power station was located, expressed the view that a full assessment of the implications of all project components should be undertaken before the consent decision on the power station was taken. The County Planning Officer commented:

My council wanted the power station [con- sent decision] deferred until all the implica- tions could be fully considered. But the Secretary of State [for Energy - the consent- ing authority for schemes of this type at the time] wasn't prepared to do this. The result is that different features of the scheme, which includes pipelines and a gas cleaning plant as well as the main station and its trans- mission lines, come up at different stages with different approval procedures. An overall view hasn't been possible.

Despite these concerns, consent for the power station was granted by the Secretary of State for Energy in November 1990. The decision was based on the information contained in the ES for the power station, and without the benefit of a public inquiry. However, crucially, the ES did not include a description or assessment of the effects of the other elements of the overall 'project', including the pipelines, gas processing facility and transmission lines, which were seen to be the responsibility of other companies under separate consent and EIA procedures. Although separate EIA procedures were in place for these other pro- ject components, so that their environmental impacts would subsequently be considered, CPRE in its complaint to the EC argued that, under the ElA Directive, the ElA for the power station should have included the main environmental effects of its associated developments. rhe failure to do so resulted in a piecemeal approach to EIA which, it was argued, contravened the requirement in the EIA Directive that all direct, indirect and secondary effects of a project should be assessed prior to consent being granted.

Sheate (1995) summarizes the argument made by CPRE:

Concern was expressed that the Secretary of State did not see fit to require further information on these aspects I the impacts of associated developments], as he is entitled to do under the UK's own implementing legislation. IThe developer] had successfully received consent for the power station even though the major impacts on the environ- ment of the electricity transmission lines, the gas pipeline, the gas processing facility and the CHI' pipeline did not feature in the accompanying documentation provided to the Secretary of State for Energy. Since the relevant information was not available to the Secretary of State - nor did he request such information - it was argued that his decision might not have been the same had all the relevant information been available to him. Since the information was not contained in the ES, neither the public nor interest groups had been alerted to these consequential im- pacts, which might otherwise have caused a public inquiry to be held where the issue would inevitably have been aired.

At the time of the case study, responsibility for new transmission lines in England rested with the National Grid Company (NGC), not the devel- oper of the power station. NGC had an obligation to connect a new electricity generator into the national grid, and - if significant environmental impacts were likely - it was required to undertake its own EIA for new overhead lines or major upgrades of existing lines. EIA would therefore take place for new transmission lines (and for other types of associated development). However, this EIA process was undertaken after the power station had been given consent, and it was therefore unable to influence the decision over whether the power station should have been built in the first place, either in that location or somewhere closer to the existing transmission network, hence minimizing the adverse visual impacts of new overhead lines.

Essentially, the Wilton case revolved around the way in which 'projects' are defined for the purposes of EIA. The ES for Wilton power station referred to the 'overall project' as including both the power station and its associated developments, such as transmission lines. However, because of the fact that different elements of this overall project were subject to separate consent procedures, the project was divided into separate 'sub-projects', with the environmental impacts of each being assessed separately and at different time periods depending on the timescale of the various consent procedures. CPRE argued that, under the Directive, it was not appropriate to assess the impacts of associated developments in isolation from (and after) the main development, including the implications of the latter's location.

In their response to CPRE's complaint, the EC agreed in principle that, in such cases, combined assessment was necessary and that splitting of a project in this way was contrary to the EIA Directive:

1 can confirm that it remains the Com- mission's view that, as a general principle, when it is proposed to construct a power plant together with any power lines either (a) which will need to be constructed in order to enable the proposed plant to function, or (b) which it is proposed to construct in connection with the proposals to construct the power plant, combined assessment of the effects of the construction of both the plant and tile power lines in question will be necessary under Articles 3 and 5 of Directive 85/337/ EEC when any such power lines arc likely to have a significant impact on the environ- ment. (Letter from EC to CPRE, 11 November 1993; emphasis added)

The UK government had argued that the proposed transmission lines in the Wilton case were not required primarily to service the new power station, since the proposed upgrading would allow NGC to increase exports of electricity from Scotland to England. However, evidence presented by NGC to the subsequent public inquiry into the power line proposals appeared to contradict this view. Although the upgrading would have some wider benefits for NGC, it was clear that the primary justification for the proposals, and indeed for the specific routes proposed, was the needs of Wilton power station. The government also argued that the Directive allowed for separate EIA pro- cedures for power stations and transmission lines, since the former tend to be Annex I projects while the latter fall within Annex II of the Directive (for which EIA is required only if significant effects are likely). However, the Directive requires an assess- ment of direct and indirect effects, which cannot be ensured for a power station scheme unless the transmission implications are included within the EIA. The Commission's response clearly supported this interpretation of the Directive.

Despite this clarification of the purpose and intention of the Directive, the EC decided against taking infringement action against the UK govern- ment in this case. Earlier, action had been taken by the EC in connection with EIA for the Channel Tunnel rail link and Kings Cross terminal 'project'. In that case, the EC had argued that these two projects were indivisible, because of the effect of each on the choice of site or route of the other:

The effect of dividing the London-Channel Tunnel project into the rail link on the one hand, and the terminal on the other, leads to the circumvention of Directive 85/337/ EEC, since the siting of the rail link in London is no longer capable of being assessed and - for instance by the choice of another site for the terminal - its effects minimized during the consideration of the rail link route. Terminal and link are, because of the impact of the choice of the terminal site on the link, or the link on the site, indissociable. The intention to assess the link once the assess- ment of the impact of the terminal is [com- pleted] does not therefore make acceptable the assessment of the terminal ... , which failed, contrary to Article 3 of the Directive, to take into account the effects of its siting on the choice of [route forl the rail link. (Letter from the Environment Commissioner to the UK government, 17 October 1991)

The same argument seems to apply in the Wilton example. The power station and transmis- sion lines were also indivisible, since the power lines would not have been required were it not for the new power station, and the location of the power station was critical to any subsequent decisions on the route of the power lines.

The proposed power line routes started in Lackenby, adjacent to the Wilton power station site, and then proceeded south to Picton, via alternative southern and northern routes. From Picton, alternative western, eastern and central routes ran south to Shipton, northwest of York (Figure 9.1). The total length of new power lines and system upgrades required was between 75 and 85 km, depending on the route options selected. The NGC itself expressed a preference for the shorter southern route from the power station to Picton, and for the western route option from Picton to Shipton. All of the proposed routes passed through or adjacent to (and visible from) important protected landscapes, including the North York Moors National Park and the Howardian Hills, an Area of Outstanding Natural Beauty (AONB). Key objectors to the proposals at the public inquiry included the local authorities through which the proposed routes ran (North Yorkshire CC,

Figure 9.1

Alterna1ive route options considered al the North Yorkshire power lines inquiry

Cleveland CC and others), the Country Landowners Association, the National Farmers Union and CPRE, as well as many individuals, including farmers and local residents. The principal issues considered at the inquiry included the visual impact of the pylons and overhead lines, potential health risks from electromagnetic radiation, issues of need and alternatives and effects on farming operations.

CPRE argued at the inquiry that the visual impacts of the proposals were unacceptable and should have been foreseen at a much earlier stage. It urged that the inquiry inspectors 'should not feel obliged to grant consent for the power lines simply because consent for the power station had already been granted and it was already being built' (Sheate 1995). It also invited the inspectors to comment on the inadequacy of the existing EIA procedures in such cases, in which

consent for electricity generation is divided from consent for electricity transmission.
The inquiry ended in December 1992 and, after a long delay, the inspectors' report was published in May 1994. It recommended approval of NGC's preferred route options - the southern route from Lackenby to Picton and the western route from Picton to Shipton, subject to various detailed modifications to minimize the environmental impacts (e.g. around East Moor, a Site of Special Scientific Interest, SSSI). However, the inspectors agreed with CPRE's views on the EIA procedures in such cases:

It seems to us that to site power stations without taking into account all relevant factors, including transmission to the areas of consumption, is likely to lead to the exten- sion of high voltage power lines through areas currently not affected and the reinforce- ment of lines in areas already affected. It is not disputed that in the view of the scale and form of the towers these lines are inevitably highly intrusive and damaging to almost any landscape and as a result are unwelcome.
It appears to us that there is a strong case for consideration to be given to the intro- duction of procedures to ensure that consents for future power stations take account of the resulting transmission requirements, and the environmental impacts of any necessary extension or reinforcement of the National
Grid, between the proposed generating plant and areas of consumption. (Inspectors' conclusions, 23 September 1993)

The failure of the EIA for Wilton power station to address the implications of transmission connections resulted in a situation in which 'Teesside Power Limited [the developer] neither had to demonstrate the full implications of the siting and development of the power station, nor to bear the full economic and environmental costs' (Sheate 1995). This was because there were limits on the costs that could be recouped by NGC for the provision of transmission connections to individual generating projects. This meant that NGC was under commercial pressure to develop the cheapest options, since any additional costs incurred to minimize the environmental impact of power lines - such as taking a longer route through less sensitive areas or placing all or part of the route underground - would be borne by NGC rather than the power station developer.

Sheate (1995) argues that the Wilton power station case provides powerful evidence that, at the time, the procedures for consent approval in the electricity supply industry ran counter to the letter and spirit of the EIA Directive. According to Sheate, the situation could have been remedied by an amendment to the Electricity and Pipeline Works EIA Regulations. rhe suggested amendment read as follows:

An environmental statement shall include information regarding the overall implica- tions for, and impact of, power transmission lines and other infrastructure associated with the generating station where these are likely to have significant effects on the environ- ment. (CPRE, letter to DTI, 22 February 1993)

The effect would be that, in cases where power lines or other associated infrastructure were likely to have a significant effect on the environment, these impacts should be material considerations in whether consent for the power station should be given and the Secretary of State for Energy should be aware of these before giving consent.
The consequence of such an amendment would be to ensure that power station pro- ponents were forced to consider the trans- mission implications of their proposals, and that they would form part of the EIA and of any subsequent public inquiry. It would begin to reduce the difficulties that arise over the definition of projects and programmes. (Sheate 1995)
The case also highlights a wider problem within the ElA Directive concerning its ambiguous definition of the term 'project'. As we have seen, this is a particular issue for projects in the electricity supply industry, but it also applies to other infra- structure projects such as road, rail and other transport schemes. It has resulted in a number of complaints to the EC about whether a larger project can be split into a number of smaller schemes for the purposes of consenting and (therefore) EIA. The problem is that EIA in the UK - as in most EU Member States - has been implemented as part of existing consent procedures, and if these are divided for a project, then so is the requirement for EIA. This so-called 'salami-slicing' of projects runs counter to the purposes of the Directive, which states 'effects on the environment !should be taken] into account at the earliest possible stage in all the technical, planning and decision-making processes' (Preamble to Directive 85/337/EEC). As the case study illustrates, this purpose cannot be achieved if EIA is applied only to individual project components rather than to the project as a whole. The issues raised by this case study remain relevant to current EIA practice. The issue of am- biguous project definition has not been resolved in the subsequent amendments to the EU EIA Directive, and consent procedures for electricity generation and transmission projects in the UK

remain divided.

This case study, researched by Weston and Smith (1999), concerns a proposed road improvement
The consequence of such an amendment
would be to ensure that power station
ponents were forced to consider the trans-
mission implications of their proposals, and

Figure 9.2

Map of the existing N21/N22 road network

The N21 road improvement scheme was an Annex II project, for which EIA is required only if there are likely to be significant environmental effects. Like most EU Member States, at the time Ireland employed a series of size thresholds to help determine whether Annex II projects should be subject to EIA. In the case of road schemes of the type proposed (rural dual carriageways), EIA was required for schemes in excess of 8 km in length or if there were considered to be significant environmental effects. In such cases, EIA was carried out by the local highways authority and submitted to the DoE. After a period of consulta- tion and a public inquiry (if one was held), the Minister for the Environment made a decision on the application. For Annex II schemes falling below the size threshold (less than 8 km in length) and not considered likely to cause significant environ- mental impacts, EIA was not required and the proposal was dealt with under normal planning legislation. This allowed for a period of public consultation, with the final decision as to whether to approve the scheme resting with the relevant
local authority. For road schemes, it was the developer of the project, in this case the County Council as local highways authority, who deter- mined whether or not EIA was required.
After commissioning a report from environ- mental consultants into the proposed scheme, Kerry CC decided that an EIA was not required in this case. This decision was based on the length of the dual carriageway section of the scheme (at
2.4 km, well below the 8 km threshold for such schemes) and on the belief that there were unlikely to be any significant environmental effects. How- ever, following the publication of the proposals, the Council received a number of objections, mainly regarding the impact of the new dual carriageway on Ballyseedy Wood. After considering these objections and the subsequent report to the Council on the scheme prepared by the authority's officers, the Council's elected members decided to proceed with the proposals. However, this was not the end of the authorization process, since the compulsory purchase orders (CPOs) necessary for the scheme to proceed still had to be served and considered at a public inquiry (the CPO inquiry). Under the Irish system, members of the public
andinterested parties were allowed to give evidence at the CPO inquiry on environmental issues. However, the inquiry and the subsequent decision (including any alterations to the alignment of the route) was based solely on land acquisition, rights of way and access issues. The CPO inquiry for the N21 scheme was held in March 1996.
Following the Council's decision to go ahead with the scheme, a local organization objecting to the proposals commissioned an ecological assess- ment of Ballyseedy Wood. This assessment con- cluded that the wood comprised an area of residual alluvial forest that, although currently lacking protected status, complied with the description of a priority habitat as set out in the EU Habitats Directive of 1992. These conclusions were accepted both by the relevant Irish national authorities and Kerry CC, and the site was subsequently proposed as a Special Area of Conservation under the terms of the Directive. The revelation of the important ecological status of Ballyseedy Wood resulted in a number of formal complaints being submitted to the EC concerning its co-funding of the proposed scheme. It was argued that the Commission should re-consider its decision to co-finance the project, given its potentially dam- aging impacts upon a habitat of recognized European-wide importance. As a result of these complaints, the EC commissioned an indepen- dent study to provide advice on whether there was a need to re-consider the co-funding of the scheme.

The EU Habitats Directive (92/43/EEC) requires all Member States to designate sites hosting important habitat types and species as Special Areas of Conservation. Together with Special Protection Areas (SPAs) designated under the Birds Directive (79/409/EEC), it is intended that these sites will form a network of European protected habitats known as 'Natura 2000'. The

Habitats Directive is designed to protect the integrity of this European- wide network of sites, and includes provisions for the safeguarding of Natura 2000 sites and priority habitats.
In cases in which a project is likely to have a
of the implications for the site in view of [its] conservation objectives'. Under the terms of the Directive, consent can only be granted for such a project if, as a result of this appropriate assessment, either (a) it is concluded that the integrity of the site will not be adversely affected, or (b) where an adverse effect is anticipated, there is shown to be an absence of alternative solutions and imperative reasons of overriding public interest that the project should go ahead. The overall intention of the Directive is 'to prevent the loss of existing priority habitat sites whenever possible by requir- ing alternative solutions to be adopted' (Weston and Smith 1999). Projects that have a negative impact on the integrity of a priority habitat, but which are able to satisfy both the absence of alternatives and overriding-reasons tests, can go ahead. However, in such cases, the developer must provide compensatory measures to replace the loss of priority habitat. I luggett (2003) discusses the development of such measures in relation to a range of port-development proposals in the UK (see also Chapter 12).
The tests set out in the Directive are not absolute and require a degree of interpretation. for example, a literal interpretation of the 'absence of alternative solutions' test could be taken to imply that any alternative that is less damaging to the protected habitat than the proposed scheme should be selected, regardless of cost or impacts on other interests. European case law provides some indi- cation as to the appropriate interpretation of the Directive's tests, and this is reviewed by Weston and Smith (1999). They conclude that both the 'absence of alternatives' and 'reasons of public interest' tests should be interpreted stringently, in view of the intention of the Directive to provide a significant level of protection to priority habitats. The application of these tests to the N21 link road proposal is now explored.

parties

- the presence or absence of alternative solu- tions; and
- the existence of imperative reasons of over- riding public interest that the scheme should go ahead.

Each of these tests is examined, drawing on the results of the independent study commissioned by the EC, as reported in Weston and Smith (1999).

Impact on the integrity of the priority habitat
Ballyseedy Wood covers 41 ha, although the priority habitat that was the subject of assessment represented only a very small part of this overall area. A small area in the northern corner of the wood accorded with the definition in the Ilabitats Directive of a residual alluvial forest; it consists of alder and ash and is subject to regular flooding. Wet woodland of this type is the least common type of Irish forest, and the surviving examples tend to be small in area; the priority habitat area covered less than half a hectare. It was this northern edge of the wood that was to be lost to the proposed dual carriageway, including the areas of greatest ecological interest.
The direct land take of the proposed scheme involved the loss of only 3 per cent of the total area of the priority habitat. However, this does not necessarily mean that the effect on the integrity of the habitat would be insignificant. The independent study concluded that:

On the basis of the assessments carried out by a number of environmental consultants and the evidence presented to the CPO inquiry, the loss of habitat could not be objectively assessed as being of no signifi- cance to the in tcgrity of the habitat as a whole. There will be change caused to the habitat as a result of the removal of trees, the change in the hydrological regime and the re-routing of the river [another clement of the scheme]. Evidence to the CPO inquiry suggested that areas of the wood, outside of the land take, would also be affected by this change. As part of EU policy the precau- tionary principle also needs to be applied to the assessment of the impact of a project on a priority habitat. In applying that principle
it must be concluded that there is a risk that the integrity of the [habitat) will be signifi- cantly diminished by the proposed road. (Weston and Smith 1999)

It was therefore concluded that the impact on the priority habitat would be negative. Nevertheless, the project could still go ahead if it satisfied both of the remaining two tests; the first concerned the absence of alternative solutions.

The absence of alternative solutions

The County Council's identification of the preferred route alignment for the proposed scheme, and possible alternative routes, was based partly on a constraint mapping exercise in which areas with various environmental constraints (such as archaeological remains) were identified. Cost factors also featured in the choice of the preferred route, and a form of cost-benefit analysis (CBA) was carried out. The Council prepared a Design Report, which set out the need for the scheme and the alternatives considered. This reveals that the Council had identified and investigated a number of alternatives. Weston and Smith (1999) identify a total of six main alternatives to the pro- posed scheme, including a do-minimum option. Most of the alternatives considered completely avoided Ballyseedy Wood, generally by follow- ing more northerly route alignments. However, other adverse impacts arose from some of these alternative schemes, such as the demolition of residential properties, farm severance and the relocation of Ballyseedy Monument, a local war memorial. Notwithstanding these impacts, a num- ber of viable alternative route options were clearly available to meet the objectives of the proposed scheme.

The CC tested the various route options against their ability to provide the best solution 'in terms of human safety, capacity and economic viability'. However, there appears to have been no systematic attempt to test the alternatives against the need to avoid the loss of priority habitat, even after the Council became aware of the importance of Ballyseedy Wood. The conclusion of the indepen- dent study was that '[the] alternatives were not examined to the same rigour or degree as the preferred route and appear to have been rejected without clearly defined and quantified justification' (Weston and Smith 1999).

An issue that appears not to have been considered by the CC in its route selection was the need to serve those areas where future develop- ment growth was planned. In this case this was the northern edge of Tralee, which was the loca- tion of a new Regional Technical College and of allocated industrial areas. This suggests that a more northerly route alignment for the dual carriageway
-
which would have avoided the impacts on Ballyseedy Wood - may have been better placed than the proposed scheme to accommodate the growth in traffic generated by these planned developments. The proposed scheme would have involved traffic serving these planned growth areas passing through the town centre of Tralee. This would have added to existing traffic problems in the town, and may have resulted in the time benefits derived from the improved N2 I being lost because of increased congestion in Tralee. The independent study comments:

It is surprising therefore that an alternative alignment for both the N22 and N21, which links the infrastructure to the areas of Tralee where future development is planned, has not been more fully investigated. A northern route proposed by private individuals, which could be of dual carriageway standard, was not adequately assessed in terms of the stra- tegic objectives of the Operational [rransport] Programme or in terms of its benefits such as avoiding Ballyseedy Wood and main- taining the existing distinctive quality of the area around the Ballyseedy Monument. There are other possible alignments that appear not to have been fully considered, such as routes south or north of the railway line [which runs to the north of the existing N21 J. Although the Council's Design Report rejects such routes because of the problems of crossing the railway line, farm severance and the impact on property, there appear to have been insufficient investigations and assess- ment on which to base such an outright rejection of such options. Overall, there is little to suggest that the Council's alternatives have been tested to the same degree as the preferred option. rhe alternatives considered were not sub- jected to detailed costings, surveys, time- saving considerations, their ecological impacts or indeed their ability to meet the strategic objectives of Structural Funding. In the absence of the rigorous testing of all alternatives against clear objectively deter- mined criteria it cannot, in this case, be concluded that the objectives of the [OTPJ cannot be achieved with an alternative solution to that which would damage the priority habitat. (Weston and Smith 1999)

The second test, an absence of alternative solutions, was therefore failed. Under the terms of the Habitats Directive, the project could not therefore proceed, since a number of viable alternative solutions were shown to have been available in this case. It was not therefore necessary to carry out the third test, the existence of imperative reasons of overriding public interest in favour of the scheme. However, it is useful to do so, since this demonstrates how this test is applied in practice in the appropriate assessment process.

Public interest issues

The third test involves the balancing of the loss of priority habitat against other imperative public interest issues. Public interest issues would out- weigh the loss of habitat if they resulted in 'far greater adverse impacts than does the loss of habitat' (Weston and Smith 1999). So, for example, if only a minor impact on the habitat was antici- pated and the alternative options would result in extreme economic or other public interest dis- benefits, then the public interest issues could be said to outweigh the loss of habitat. Conversely, if the impact on the habitat was great or uncertain, and the impact on the public interest issues was small, then the interests of the habitat would take precedence.
European case law provides some guidance on the type of public interest issues that can be considered to be 'imperative' reasons. Examples include the public interest of economic and social cohesion, human health, public safety and other environmental concerns. However,

for such public interest reasons to out-weigh the loss of habitat they must be of a similar scale in importance (as the protection of the priority habitat(- that is of interest to the • [European] Community as a whole - and be demonstrable. (Weston and Smith 1999)

In the case of the N21 scheme, it was the view of the CC that a number of public interest issues were relevant and that, when combined, the sum total of these issues outweighed the loss of the priority habitat at Ballyseedy Wood. The public interest issues arising in the case included:

- the strategic objectives of the wider OTP (of which the scheme was a component);
- the cost of alternative solutions;
- loss of family homes;
- road safety issues;
- heritage impacts on the Ballyseedy Monu- ment;
- farm severance; and
- impacts on archaeology.

The independent study into the scheme con- cluded that none of these issues could be regarded as both imperative (that is, of equal importance as the loss of habitat) and overriding (that is, sufficiently damaging to override the protection of the habitat), and therefore this third test was also • failed. The reasons for this conclusion included:

- The existence of altemative so/11tions. The fact that a range of alternative route options were available made it difficult to argue that the public interest issues arising in the case were unavoidable. For example, there was considerable local concern about the need to relocate the Ballyseedy Monument, a local war memorial, should one of the alternative routes be adopted. However, the need to relocate the Monument arose only with one of the six main alternatives considered and could therefore have been avoided by the adoption of one of the other alternative solutions.
- The alternatives wo11/d not necessarily result in

,v.reater adverse impacts than the proposed scheme.
For example, there was no evidence that, apart from one of the route options, any alternative solution would result in the loss of more family homes than the proposed scheme.

Some of the public interest issues were not demonstrable, due to a lack of data. For example, no quantified data was produced on the road safety implications of alternative routes, compared with the proposed scheme. Evi- dence from the CC at the CPO inquiry sug- gested that all alternatives examined by the Council were equally safe. Also, it was not possible to argue that the proposed scheme was necessarily the most cost-effective, since the costs of all the alternative route options had not been worked out in detail. Indeed, it was suggested 'that an alternative route may be cheaper to construct because of the decreased disruption to existing road users, the impact of construction on properties in the existing corridor and the reduction of some mitigation costs' (Weston and Smith 1999). Another issue raised was the impact of alterna- tive routes on farm severance. Again, however, 'there is little hard evidence to show that this is an area that has either been examined in any great detail, been quantified in any way or has been comparatively assessed against the [proposed] scheme' (Weston and Smith 1999).

The loss of habitat was a superior interest compare,/ to most of the public interest issues raised. Most of the public interest issues arising in the case were not equivalent in importance to the loss of priority habitat, and could not therefore be regarded as 'overriding' interests. Examples include the loss of family homes and farm severance. Although important issues at a local scale, these cannot be seen as equal in importance to the need to protect the priority habitat, given the status of the latter in the EU Habitats Directive. Similarly, in relation to archaeological impacts, in order to be of 'overriding' public interest, the archaeological feature affected would need to rank higher than the priority habitat on a European scale. There was no evidence that such impacts would arise with any of the alternative routes.

One public interest issue that appeared to be of greater importance was the need to relocate the Ballyseedy Monument, which arose with one of the alternative route options.

rhe Council and the local community gener- ally consider the relocation of the Monu- ment to be unacceptable as it is considered one of the most important modern monu- ments in Ireland. The :Vlonument, however, has no national or local statutory protection, whereas [Ballyseedy Wood] has statu- tory protection [at European level] through the [Habitats] Directive ... On that basis, the relocation of the Monument, while clearly a very important public interest issue, cannot be seen as an 'overriding' public interest in terms of the presumption established by the Directive to protect the priority habitat. (Weston and Smith 1999)

Having failed all three of the tests required under the 'appropriate assessment' process, EU funding for the proposed N21 link road scheme was withdrawn.

The case study demonstrates that the process of appropriate assessment under the Habitats Directive, once a negative impact on a priority habitat has been established, is an exacting one. In particular, few projects are likely to have a genuine absence of viable alternatives, especially if the search for possible alternatives is widely defined. Also, to outweigh the loss of priority habitat, public interest reasons must be of equal or greater weight than the protection of priority habitats at European level. This means that issues of only local or even national importance would not be sufficient. Finally, as illustrated above, the absence of alternatives and imperative reasons tests are inextricably linked. 'While there remains the possibility of alternative solutions there are unlikely to be "imperative reasons of overriding public interest" to justify the preferred solution' (Weston and Smith 1999). Further guidance on the appro- priate assessment process is provided in EC (2000, 2001, 2007) and Chapter 12.

public

interest issue that

practitioners. However, Snary (2002) points out that recent studies indicate that public opposition to such facilities is often based on a much wider range of considerations, including 'concern about the appropriateness of the waste management option, the trustworthiness of the waste industry and the perceived fairness of the decision-making process'.

Reflecting this improved understanding of the nature of public opposition, a number of commentators have called for better communica- tion with the public at all stages of the waste management facility planning process (ETSU 1996; IWM 1995; Petts 1999). Such communication can take a variety of forms, ranging from a one-way flow of information from developer to public, through different levels of consultation and parti- cipation (in which there is a two-way exchange of views between the public and the developer and/or consenting authority, and the public's views are a legitimate input into the decision-making process). All of these types of communication arc seen to be important components in the planning and EIA process for incinerators and other waste facilities, as Snary (2002) explains:

Concerns about health risks require com- prehensive information on the [predicted] emissions and a consultation process through which the public's views can affect the decision-making process. Concerns about the ability of the waste industry and regulators to manage risk competently require parti- cipation in a process through which their concerns can be openly addressed and condi- tions of competency discussed. Debate con- cerning fundamental policy issues and the legitimacy of the waste planning process [also] requires a public participation process through which a consensus may be built [at the plan-making stage of the waste incin- erator planning processI.

The search for improved methods of public participation is also linked to the growing social distrust of science and experts noted by a number of commentators (see, for example, House of Lords 2000; Petts 2003; Weston 2003).
Hampshire is a county on the south coast of England, with a population of around 1.6 million. By the end of the 1980s, the county was faced with the problem of increasing volumes of household waste, set against a background of an ageing stock of incinerator plants (which failed to meet the latest emission standards) and growing difficulties in finding new and environmentally acceptable landfill sites. In response, the County Council's Waste Management Plan (1989) advocated an inte- grated approach to waste management, supporting recycling and waste minimization initiatives and emphasizing the need for a reduced reliance on landfill. Government financial regimes in operation at the time (the Non-Fossil Fuel Obligation) also provided cost incentives for the development of energy-from-waste schemes rather than landfill. It was also recognized that significant economics of scale could be obtained by developing a single large plant in the county rather than several smaller ones. As a result, following a tendering process, an application was submitted at the end of 1991 for a large energy-from-waste incinerator in Ports- mouth, in the south of the county on a site selected by the CC (Petts 1995). The capacity of the plant was 400,000 tonnes per annum, which represented two-thirds of the household waste arising in the county (Snary 2002). rhc proposed location was on the site of one of the county's redundant incinerators, which had been closed in 1991 after failing to meet the latest emission standards.
practitioners.

waste management strategy for the area (Snary • 2002). The failure to gain approval for the proposed scheme resulted in a change of approach from the County Council, as Petts (1995) explains:

Ily the summer of 1992 the County Council • had failed to gain approval for the plant and was facing an urgent task to find a solution to the waste disposal problem. The energy-from-waste schemes would be needed as part of an integrated waste management strategy, but there was considerable concern about their environmental effects and the monitoring of plant; and
landfill was the least preferred option (Petts l 995).

The public participation exercise in Hampshire
traditional approach had failed. While the
!county's waste management! plan which had supported the need for [energy-from- wastel had been subject to public consulta- tion with relatively little adverse comment, this was now regarded as too passive a pro- cess and it seemed that the real concerns and priorities of the community had not been recognized by the County !Councill. There had not been strong support of the need for an integrated approach to waste manage- ment and there had been little recognition of the need to 'sell' [energy-from-waste] to the public. The proponents had been overly optimistic about their ability to push the pro- ject through with the standard, information- based approach to public consultation.

Faced with these problems, the CC embarked on the development of a more integrated and publicly acceptable household waste management strategy (Snary 2002). The Council's new approach involved an extensive proactive public involve- ment programme, launched in 1993, to examine the various options for dealing with household waste in the county. The aim was to attempt to establish 'a broad base of public support for a strat- egy which could be translated into new facilities' (Petts 1995). As part of this process, Community Advisory Forums were established in the three constituent parts of the county, based on the model of citizens' panels. Membership included a mix of people with different interests and backgrounds, including those with little prior knowledge of waste issues. At the end of the process (which lasted for six months), the forums presented their conclu- sions to the CC. The broad consensus reached was that:

- greater efforts should be made in waste reduction and recycling; 9.4.4

The contact group process

resulted in the inclusion in the county's revised waste strategy (1994) of plans to build three smaller energy-from-waste incinerators (each with a capacity of 100,000-165,000 tonnes), rather than the single large incinerator originally proposed. l'he new plants were to be located in Ports- mouth (on the same site as the earlier application), Chineham, near Basingstoke, and Marchwood, near Southampton. EIA work for these proposed developments began in 1998 (Petts 2003). It is the first of these plants that is the focus of this case study.

The ElA process for each of the three proposed incinerators in Hampshire involved a method of public participation known as the 'contact group' process. This involved an extended process of public questioning during the preparation of the ES for each site through a contact group involving a range of key local interests. These contact groups were established by the developer, Hampshire Waste Services (HWS), and were part of the contractual requirements placed on the company by the CC (Petts 2003). This approach had the potential to enable the public's views to result in reassessment of issues dealt with in the ES, and to changes in the project proposals and mitigation measures, prior to the submission of the ES to the competent authority. The terms of reference for the Portsmouth contact group stated that it was designed (a) to allow key members of the public to develop in- formed decisions about waste issues and the proposal; and (b) to assist the developer (HWS) in ensuring that it understood and responded to the views of the members of the local commun- ity (Snary 2002). The arrangements for extended public participation in this case go beyond the legal requirements under the UK EIA Regulations (discussed in Chapter 6), and were the first time that such methods had been used in the UK EIA process for a waste incinerator (Snary 2002).
In the Portsmouth incinerator case, 10 members of the public were included in the contact group -
they were selected by HWS to represent a range

interviews with those involved; the process has also been evaluated by Petts (2003), drawing on observation of all three contact groups. Key find- ings are summarized below, focusing in particular on the limitations of the process in practice.
of local interests, and included a representative • from the local school, the local branch of Friends
of the Earth (FOE), and the Portsmouth Environ- mental Forum, plus seven representatives from the six neighbourhood forums in closest proximity to the project site. Group members were encouraged to network with the local residents in their neighbourhood. It was made clear to participants that membership did not imply support for the proposals, and indeed almost all of the participants were opposed to the development.
The contact group met once a week over a six- week period immediately prior to the submission of the planning application and ES in August 1998. Issues covered by the contact group at these meetings included:

- waste-to-energy incinerators and EIA; •
- design of the plant;
- noise and traffic assessments;
- visual and ecological issues;

- alternative sites and noise issues; and
- air quality issues and health risk assessment. 9.4.5

Evaluation of the process

Information was provided on these issues by HWS and by its consultants at the meetings. During • discussions, the participants were able to make their views known by raising questions, concerns and suggestions. Answers to questions were pro- vided on the day and in written form at the next meeting. There was also a closing meeting to discuss the conclusions of the ES. An independent chairperson was appointed by HWS 'to ensure that all participants had an equal opportunity to contribute to the meetings and that issues were fairly addressed' (Snary 2002). •

How effective were the methods of public participation employed in this case, and what were the views of the various participants in the process? Snary (2002) has assessed the success of the contact group process in the Portsmouth case, based on

The contact group process took place too late in the EIA process. The contact group meetings started only six weeks prior to the submission of the ES, and by this stage the majority of the EIA work had been completed. The oppor- tunity for the group to influence the way in which impacts were defined, assessed and evaluated was therefore very limited. This was particularly true of the health risks posed by emissions, which were discussed only at the last meeting of the group. The process would have been more effective if it had started during the scoping stage of the EIA. How- ever, the scoping exercise was restricted to consultation with the local planning authority and statutory consultees, with no public involvement (Snary 2002).

Insuf(,cient time was allowed for the process. A number of participants commented that the meetings were attempting to cover too much information - often of a complex nature - in too short a time. Again, this suggests that the process should have been started earlier to allow the wide range of issues involved to be dealt with adequately.

Criticisms were made of the ETA co11s11ltants.

Participant criticisms included the view that assessments were based too much on desk studies and that the consultants lacked detailed knowledge of the locality; that the consultants did not always provide adequate answers to questions; and that the EIA work should have been undertaken and presented by independent consultants (i.e. not employed by the developer).

Participants were generally better inf'onned about the proposals. Almost all participants stated that they felt better informed about the issues relating to the proposal as a result of attending the meetings. This is hardly surprising, but the developer's project manager also argued that the process had 'informed key members of the public better than the traditional methods of public involvement could ever have done'
(Snary 2002). However, doubts were expressed about the complex nature of the information provided about the health risks posed by the development. One participant commented: 'I am not a scientist and I found it very diffi- cult to understand. I felt as though they were trying to blind me with figures and technical terms. The residents that I have spoken to who went to have a look at the environmental statement felt exactly the same; they didn't really understand the assessment.' These criti- cisms are partly related to the tight timescale for the contact group process, although non- experts will always need to have a degree of trust in those providing technical information in EIA. Snary suggests that such trust could have been increased by the use of independent consultants or an independent third party to summarize and validate the information presented.

- Limited impact on the development proposals.

The project manager for the development stated that the process had resulted in changes to the architecture of the scheme (in particular the colour of the buildings) and improve- ments to the traffic assessment. However, apart from these relatively minor changes, many participants were sceptical about how else the views of the group had affected the proposals. These findings are not surprising, given the fact that the meetings took place at such a late stage in the planning, design and EIA work for the scheme.

Low levels of trust in the developer and consult-m1ts. Reasons included a feeling that the developer was bound to be biased because its aim was to gain planning permission, a view that group members were only being provided with part of the information about health risks and concerns over the competency of the EIA consultants.

- The process fi1iled to resolve fundamental co11- cems about the proposal. All but one of the

9.4.6 Summary

9.5 Humber Estuary development: cumulative effects assessment

9.5.1 Introduction

9.5.2 The Humber Estuary CEA

participants still had relatively strong risk- related concerns about the proposal at the end of the contact group process. Therefore, although the contact group was able to better inform key local stakeholders about the risks posed by emissions, it was unable to convince the majority of the group that the risks were acceptable and that waste-to-energy incinera- tion was an appropriate waste management solution (Snary 2002). f"his is despite the fact that the Portsmouth incinerator proposal emerged as part of a county-wide waste strat- egy that was developed through an extensive and innovative public involvement exercise. Snary attributes this to inadequacies in the earlier strategic-level consultation exercise, which had failed to reach a consensus on the appropriate role of waste-to-energy incinera- tion in the county's waste strategy and which most of the contact group members had been unaware of prior to joining the group. It was also unclear how the views expressed in the strategic consultation had influenced the county's developing waste strategy.

In her evaluation of the Hampshire contact group process, Petts (2003) reaches broadly similar conclusions:

While the process did open up the environ- mental assessment to detailed questioning by a small but representative group of the public, it arguably started too late in the limited regulatory process to allow the Con- tact Group members to frame and define the problems to be considered and assessed. During the author's own observation and evaluation of the process, it was evident that questions about the assessment methods were able to be raised (for example, the Portsmouth Contact Group identified deficiencies in the transport assessment based upon knowledge of cycling on the local roads). Some reassess- ment did take place as a result of such a public quality assurance mechanism. How- ever, this was limited. Participants valued the opportunity provided to them to review the assessment but were suspicious that outcomes had already been decided.

This case study has illustrated the use of extended methods of public consultation in EIA, which go beyond the minimum legal requirements in the EU EIA Directive. These methods are not without their practical difficulties, and these have been highlighted. The main weakness in this case appears to have been that the contact group meetings started too late in the overall EIA pro- cess. Public involvement at the scoping stage of the EIA may have helped to avoid some of the problems encountered. As a postscript, after a public inquiry was held in 2000, planning per- mission for the Portsmouth incinerator was finally granted in October 2001 - some IO years after the initial application for an incinerator on the site had been submitted.

This case study provides an example of an attempt to assess the cumulative impacts of a number of adjacent concurrent projects in the Humber Estuary, Humberside, UK, undertaken in the late 1990s. This type of cumulative effects assessment (CEA), which was undertaken collaboratively by the developers involved in the various projects, is relatively uncommon in EIA. However, a number of other examples do exist, for example, in wind energy development cases in which several wind farms have been proposed in the same area. More generally, the assessment of cumulative impacts is widely regarded as one of the weak clements in project-level EIA (see, for example, Cooper and Sheate 2002; also Chapter 12).

Cumulative effects assessment studies of the type described here present a number of difficulties, and the case study examines how and to what extent these were overcome. The benefits derived from the CEA process are also discussed, from the viewpoint of the various stakeholders involved. This case study is based on research carried out by Jake Piper as part of her PhD studies with the IAU, Oxford Brookes University, and has previously been documented as Piper (2000). The Humber Estuary case study, together with a number of other examples of cumulative effects assessment in the UK, is also examined in Piper (2001a, b, 2002).

This case study involved a cluster of adjacent projects, proposed at around the same time by different developers. Each of the proposed projects required EIA, and because of the variety of project types, more than one consenting authority was involved in approving the projects. However, the developers concerned agreed to collaborate in the preparation of a single CEA of their combined projects, which was presented to each of the consenting authorities simultaneously.

In 1996-97, five separate developments were proposed along the north bank of the Humber Estuary, within a distance of 5 km of each other. The projects included:

- a new wastewater treatment works serving the city of Hull;
- a 1200 MW gas-fired power station; a roll-on/roll-off sea ferry berth;
- reclamation works for a ferry terminal; and
- flood defence works.

The five proposed projects involved four separate developers and five consenting authorities. The environment in the vicinity of the projects was a sensitive one, with a European site for nature conservation - an SPA designated for its bird inter- est under the EU Birds Directive and EU Habitats Directive - located within a short distance of the developments. It was the presence of this site, and the almost concurrent timing of the projects, that prompted the CEA study in this case. Indeed, the CEA was designed to satisfy the requirements for an 'appropriate assessment' of the effects of the proposed schemes on the SPA, under the terms of the Habitats Directive (similar to the process described in Section 9.3). It was also hoped that the CEA would help to avoid lengthy delays in securing approval for the projects, as Piper (2000) explains:

The strategy adopted assumed that, by providing a common assessment to answer the needs of each of five competent authori- ties involved ..., the amount of interplay and discussion required between these authorities would be reduced, avoiding lengthy delays . .. The strategy means, however, that any insoluble problems associated with any one • project could tie up all consent applications simultaneously. •

In order to guide the CEA process, a steering • group was established consisting initially of the
a combined timetable of major construction works;
bird disturbance potential (sensitivity in each month of the year);
timetable of construction work potentially affecting birds, and monthly sensitivity;
developers and the two local authorities concerned.

Other key statutory consultees, including the Environment Agency and English Nature, joined the steering group later, but non-governmental environmental organizations and the public were not directly involved.

A single environmental consultancy prepared the CEA, acting equally on behalf of all four developers. Draft reports were prepared in consul- tation with the statutory consultees and devel- opers, with opportunities for review and comment. Close liaison with EN (the statutory body res- ponsible for nature conservation) was an important element in the process, given the need to specific- ally address the potential impacts on the SPA. It was important to ensure that

the document pre- sented to the local authorities and other consenting authorities also fulfilled the requirements of this statutory consultee.
The steering group was involved in determining the scope of the CEA, but no public participation was arranged for this stage of the study. The scoping exercise identified those issues where there was potential for cumulative effects to occur. These included, during the construction phase, effects on bird species on the SPA site and on traffic, and during the operational phase, effects on estuary hydrodynamics, water quality and aquatic ecology. Data was made available for the study by the developers, including information from existing EIA work already undertaken; some additional modelling work was also carried out. The infor- mation provided included the probable timing of activities within the construction programmes for each project, the manpower requirements for these activities and associated traffic movements. Existing baseline data available included the range of bird species present at different times of year in the SPA, and their vulnerability to disturbance (Piper 2000). Prediction of cumulative impacts was assisted by the production of a series of tables and matrices, which brought together the levels and timing of impacts identified for each project. These included:

- potential aquatic impacts of the developments; and
- predicted traffic patterns (vehicles per day, for each month of the construction works). 9.5.3 Costs and benefits of the CEA

In arriving at predictions, it was decided to use the developers' best estimates, rather than a worst- case scenario approach (Piper 2001a).
As a result of the cumulative impacts predicted, a number of additional mitigation measures were proposed (in addition to those measures that would have been considered had the schemes been assessed separately). Examples included the scheduling of certain noise-generating construction activities such as piling outside sensitive periods (e.g. bird roosting), and the introduction of staggered working hours to reduce peak traffic volumes. It was also proposed that the design of adjacent projects should be integrated in such a way as to minimize environmental impacts. An example was revisions to the design of the ferry berth structure to complement the design of the outfall from the water treatment works, and so enhance mixing of water in the estuary. finally, recommendations were made for continued monitoring of the cumulative effects on birds and the aquatic environment. Responsibility for funding this work was shared among a sub-group of the developers involved in the proposed schemes (Piper 2000).

process
Piper (2000) has assessed the costs and benefits associated with the Humber Estuary CEA study, drawing on a series of interviews with those involved in the process, including the developers, the relevant local authorities, other consenting authorities and statutory consultees. The views of these different stakeholders are summarized below, beginning with the developers of the proposed schemes.
Views of developers

- Greater 1111eierstmuiing of the area and potential development impacts. Three of the four developers felt that the CEA process had increased their understanding of the estuary and the potential impacts of the proposed developments. For example, the power station developer referred to better understanding of the impacts to the mudllats and birds and potential traffic impacts, while the dock developer emphasized greater understanding of the hydrodynamics and morphology of the estuary and the relationship between the schemes and the SPA.
- Other benefits. These included the development

of local relationships, including closer working relationships with the other developers, LPAs and statutory consultees; the establishment of a consistent basis for mitigation and monitor- ing; the opportunity to share the costs of ongoing monitoring work in the estuary; and
- for one of the developers - the fact that the CEA process had facilitated the rapid achieve- ment of planning approval.

- Financial costs of the CEA process. The financial cost of undertaking the CEA was relatively low for all of the developers, although the majority of the cost was in fact borne by a single developer (the water utility company). The cost of the CEA to this company repre- sented around 5 per cent of the total cost of the EIA work for its proposed scheme. Costs were much lower for the other developers.

- Changes to the project proposals a11d additional mitigation. The CEA process resulted in some changes to the original project proposals and additional mitigation measures, which would not have occurred if the projects had been assessed separately. Examples included changes to piling operations during the power station construction to minimize noise impacts, modifications to the ferry berth con- struction to compensate for loss of bird habitats elsewhere in the estuary, changes to the timing of certain construction activities and staggering of working hours to minimize peak traffic !lows. All the developers indicated that the additional mitigation prompted by the CEA had added relatively little to the costs of the overall development. This may reflect the ability to share the costs of mitigation meas- ures between the developments. Without this opportunity, mitigation might have been less effective or more costly (Piper 2000).

- Delays camed by the CEA process. Views differed about whether the CEA process had resulted in a saving or loss of time in obtaining consent for the proposed schemes. In part, this reflected the stage in the planning approval process reached by each developer at the start of the CEA process. Delays ranged from one to two months for the water utility company to six months for the dock developer (this last delay was attributed to the late involve- ment of a statutory consultee, despite an earlier invitation to join the study); the power station developer felt that its timetable had not been affected. Some delay may have been caused by the fact that the CEA process began after the bulk of the initial consultation and assessment work on some of the schemes had been completed. This resulted in some dupli- cation of effort.

- Other ismes. One developer noted the prob- lem of distinguishing between those changes that resulted from the CEA process and those that would have occurred anyway through the proper consideration of each scheme in isolation. A further issue concerned the appro- priate treatment of new projects that may come forward in the area after the initiation of the CEA. Should such projects be incorp- orated into the CEA process, implying an open-ended timescale for the process, or should a new CEA be started for the next group of schemes?

Views of local planning authorities and consenting authorities

The two local planning authorities responsible for the area in which the developments were located were supportive of the CEA study and identified a number of benefits from the process:

The study was found to be helpful in assessing the overall impact of several major projects proposed for a relatively small geographic area. The study was very helpful in its technical assessment of impacts. The study was definitely of great value for both [coun- cils] in understanding likely impacts. [It] was probably of equal value in demonstrating the likely impacts to the developers themselves, making them fully aware of the potential consequences of their proposals. (Comments from local authority representatives, quoted in Piper 2000.)

The point was made that local planning auth- orities lack the technical expertise and resources to carry out detailed review of environmental assessments, and therefore rely on the integrity of ES authors and consultants to identify areas of potential concern. In this respect, 'a major factor in favour of the CEA [process] is that the advisers of each scheme proponent help "to monitor the others", thus "producing a more balanced product'" (Piper 2000). Both authorities com- mented on the lack of public participation in the CEA study. One noted that, partly due to the tight timescales involved, there had been little or no public consultation, and that this represented the main weakness in the process.

Other consenting authorities included three government departments (DTI, DETR and MAFF). The DTI commented that the study had facilitated decision-making, stating that 'without the CEA, the power station project would have been refused' (quoted in Piper 2000). The CEA approach would be recommended in similar cases of multiple projects elsewhere.

Views of statutory consultees
English Nature, as the statutory body responsible for nature conservation, was the principal con- sultee in this case and was involved in the CEA process from an early stage. It was necessary for the CEA to satisfy the requirements of EN, given its responsibilities under the Habitats Directive to ensure the protection of the SPA. These require- ments were expressed in a number of planning conditions attached to the consents for the various schemes:

The conditions covered the mitigation of construction works (via measures to reduce disturbance of birds, a code of practice for
personnel and compliance with a programme of works designed to take account of other CEA-related construction projects) and the monitoring of construction. A monitoring scheme was outlined which will last through- out construction and for 5 years subse- quently and will observe the movements and ranges of population of waterfowl. Provided these stipulated conditions arc met, English Kature was of the opinion that the various projects would not, individually or [in com- bination], adversely affect the conservation objectives of the Special Protection Area. (Piper 2000)

English Nature commented that a number of factors - some of which were unique to this case -
had assisted the completion of the CEA. These included the relatively small geographical area covered by the schemes; the fact that all schemes were at an early stage of development at the start of the process, although some project-specific EIA work had already been completed; the absence of direct competition between the developers to be the first to obtain planning consent; and the willingness of one of the developers (the water utility) to take the initiative in getting the study underway (Piper 2000). The latter was seen as particularly important, given that responsibility for undertaking the 'appropriate assessment' under the Habitats Directive properly rested with the consenting authority. As we have seen, in this case there were no fewer than five different consenting authorities. It was suggested that: 9.5.4
4 Summary

9.6
Stansted airport second runway: health impact assessment 9.6.1
Introduction

9.6.2
Background to the proposals

it would have been problematic to sort out exactly where responsibility lay, had the CEA strategy not been devised by the water utility and its advisers. For these reasons English Nature indicated that, whilst CEA was 'an excellent solution' [in this particular case], it is not a method of immediate and general applicability but depends upon the circumstances encountered in each case. (Piper 20001

The consideration of cumulative effects is widely regarded as one of the weak areas in EIA, both at project level (see Section 12.4) and in some SEA studies (see Sections 9.8 and 9.9). This case study has demonstrated a novel approach to the assessment of cumulative effects, in this case associ- ated with the impacts of a number of adjacent proposed developments. The assessment process was made possible by a number of factors, in- cluding the willingness of one of the developers to take the initiative in starting the CEA study and the fact that the developers involved were not directly in competition with each other. These circumstances may not apply in all such cases. Nevertheless, CEA studies of the type described have a number of benefits, for developers, con- senting authorities and other key stakeholders, and - at least based on the evidence in this case - appear to involve relatively little additional cost.

This case study provides an example of health impact assessment for expansion proposals at a major airport in the southeast of England. I lealth impact assessment (HIA) is frequently undertaken as a parallel process alongside EIA and there are close links and partial overlaps between the two processes. rhe purpose of HIA is to identify and assess the potential health effects (adverse and beneficial) of a proposed project, plan or programme, and to provide recommendations that maximize beneficial health effects and reduce or remove adverse health impacts or inequalities (see also Chapter 12). At the time of the case study, HIA was not a regulatory requirement in the UK planning process. However, relevant government policy on air transport indicated that both EIA and HIA would be expected for major airport expansion proposals.

The case study concerns proposals for a second runway at Stansted airport in Essex. It provides an interesting example of the application of HIA to a major project proposal and reveals the close linkages between HIA and EIA. The Stansted HIA was an example of 'comprehensive HIA', characterized by extensive stakeholder engagement and assessment methodologies based on a detailed review of the scientific literature. Weaker aspects of the assessment included the scoping out of certain health effects and a failure to adequately consider the cumulative effects of the airport's overall planned growth. There was also no consideration of alternatives in the assessment and as a result the overall level of influence of the HIA on the project proposals appears to have been limited.

Stansted airport is located in Essex, around 35 miles north east of central London. It is the third busiest airport in the UK, after I leathrow and Gatwick, with almost 19 million passengers in 2010. The second runway proposals at Stansted date from the mid-2000s. At this time, passenger numbers at the airport had experienced very rapid growth during the previous decade and the capacity of the existing single runway was expected soon to be reached. Further impetus for the proposals was provided by a government White Paper, 'The future of air transport', published in 2003 (DIT 2003). The White Paper set out a national, strategic policy framework for the development of UK airport capacity for the next 30 years. In relation to Stansted Airport and the wider southeast region, the government concluded that:

- there was an urgent need for additional runway capacity in the southeast;
- the first priority was to make best use of the existing runways, including the remaining capacity at Stansted and Luton;
- provision should be made for two new runways in the southeast by 2030; and
- the first new runway should be at Stansted, to be delivered as soon as possible.

9.6.3 Aims and scope of the HIA

The government invited airport operators to bring forward plans for increased airport capacity in the light of the White Paper's conclusions. The White Paper also stated that, in all cases where development was envisaged, full EIA would be required when specific proposals were brought forward. Operators would also be expected to undertake 'appropriate health impact assessment' (Dff 2003).

In response to the White Paper's support for expansion at Stansted, the airport's operator, BAA, brought forward proposals for two future phases of development. The first of these phases was known as Generation I (or GI), followed by Generation 2 (or G2). The Gl and G2 proposals were submitted as separate planning applications and were subject to separate EIA/HIA processes (ERM 2006, 2008). The G1 proposals sought to lift existing planning conditions limiting the annual number of passengers and flight movements at the airport (from 25 to 35 million passengers and from 241,000 to 264,000 air traffic movements per annum). This was to be achieved by making maximum use of the capacity of the existing run- way, along with limited physical development (e.g. expanded terminal buildings). The G1 planning application was submitted in 2006. Permission was refused by the local planning authority, but BAA appealed against this refusal and the proposals were considered at a public inquiry held in 2007. Following the inquiry, planning permission was granted by the government in October 2008.

The G2 development involved proposals for a second runway and associated rail and road improvements in the immediate vicinity. Expanded passenger and aircraft handling infrastructure was also proposed, including a new terminal building, hotels, catering and car parks. Unlike the Gl development, the proposals also involved a substantial extension to the perimeter of the airport. A four year construction project was envisaged, with the second runway becoming operational in 2015. The additional capacity provided was expected to result in an increase in passenger numbers to 68 million by 2030. The G2 planning application was submitted in March 2008. The application was 'called in' for determination by central government following a public inquiry. However, before the start of the inquiry, the election of a new coalition government signalled a change in national airport policy. The new government announced in May 2010 that it would refuse permission for additional runways at Stansted and Gatwick. Consequently, on the basis that there was no longer government support for the proposals, BAA withdrew its application.

The Stansted second runway development proposals were subject to EIA. Health impact assessment was undertaken as a separate process, although there were important links between the EIA and HIA work. The overall objectives of the HIA were agreed between BAA and Essex Strategic Health Authority as to:

- identify the potential local health effects (positive and negative) from the G2 project;
- assess the likelihood and scale of the key local health effects; and
- make evidence based recommendations, which maximize positive effects and minimize negative effects and, as appropriate, recommend local requirements for monitoring local health effects.

The HIA was undertaken by consultants ERM, with support and advice from a Health Topic Group comprising representatives from local and regional public health organizations, the local planning authority and the applicant (HAA). HIA is normally categorized as either 'rapid HIA' or 'comprehensive HIA', depending on the time taken to complete the assessment and the extent of consultation undertaken. The Stansted HIA was an example of comprehensive HIA, reflected in the range and complexity of the methods used to predict the health consequences of the project and the extensive stakeholder engagement undertaken. The assessment also adopted a broad definition of health, encompassing physical, mental and social well-being. The scope of the HIA included the health effects on local residents arising from project-induced changes in the following:

- air quality;
- noise (air and ground noise);
- transport;
- employment and income;
- social capital;
- involuntary relocation;
- visual effects and light pollution; and
- health care and community facilities.

Certain aspects of the project and associated developments outside the airport were excluded from the HIA scope. These included the following which the project might have implications for issues: health. Identification of these 'health pathways' involved an examination of the characteristics

- expansion associated with development in the Ml 1 corridor (as this was addressed in the

regional planning strategy);

- health service infrastructure planning for population expansion around the airport (as this was being considered separately by the local Primary Care Trust through its strategic and operational plans);

- any implications for emergency plans (as it was assumed that these would be addressed through existing emergency planning pro- cesses); and

- the effects of climate change on human health (as this was regarded as a wider than local impact and was therefore deemed to be outside the scope of the HlA).

The health effects of the Stansted G1 develop- ment proposals, which had yet to be approved at the time of the assessment, were also excluded (this is discussed further in Section 9.6.7). The geographical scope of the assessment was confined to those communities adjacent to the airport. In practice, this area covered four local authority districts in Essex and Hertfordshire which were closest to the airport and considered most likely to experience health effects. A smaller inner zone within this area was also defined for the consideration of certain health effects (e.g. based on predicted pollutant concentrations and aircraft noise contours). The assessment consisted of the following key stages:

- project profile;
- community profile;
- sakeholder engagement;
- development of the assessment methodology;
- assessment of health impacts; and
- mitigation/enhancement and monitoring. 9.6.4
 Project profile

Each of these key stages is discussed in more detail in the remainder of the case study.

This first stage of the assessment was designed to identify the main routes or pathways through of the development proposals and identification of their potential influence on health determinants. The key health pathways identified were associated with the following project features or activities:

- Construction: implications for exposure to environmental influences (e.g. increased noise, dust and traffic movements).

- Land take: implications for the functioning of and networking within communities ('social capital'), and access to health care and trans- port services.
- Increased aircraft, rail and road traffic move- ments: implications for increased exposure to noise and air pollutants, accessibility and the potential for injury.
- Changes to local roads: implications for com- munity severance, access and social capital.
- Increased employment opportunities: implica- tions for improved socio-economic well-being, reductions in unemployment and reduced inequalities.

9.6.5 Community profile

It was also acknowledged that the development may influence additional pathways not associated with physical changes but reflecting intangible and/or perceived effects. These could include effects on social networks, community identity, access and accessibility and well-being. Most of the identified pathways were taken forward for detailed assessment in the HIA, although some minor health pathways were scoped out at this stage. These pathways were judged to have insufficient influence on health determinants to have health outcomes of consequence. Examples included the generation of dust, odour, fuel dumping, disrup- tion to utilities and the visual effect of additional vehicles.

A community profile was drawn up to provide a description of the communities that might be affected by the project. The profile was based primarily on information for the four immediate local authority districts. However, a more detailed study area was also defined, comprising those parishes most likely to be directly affected by the development. This area was defined using four main criteria:

- Land take: defined by the proposed boundary of the expanded airport.
- Aircraft noise: defined as the 54 dBA noise contour for the proposed development, based on air traffic predictions for 2030. This contour represented the lowest threshold noise level at which community annoyance was con- sidered likely to be experienced.
- Visual impacts: defined as the zone of visual influence, from which the expanded airport would be visible.
- Secondary socio-economic effects: defined as those areas most likely to be affected by

9.6.6 Stakeholder engagement

secondary effects associated with the con- struction workforce for the development and the services and facilities needed.

The resulting study area was not simply a circular zone defined by a radius from the airport, but a more complex area reflecting the likely distribution of key health effects. rhis area com- prised 26 parishes in a zone extending to the south- west and north-east of the airport. This distribution largely reflected the orientation of flight paths and the resulting noise contours with the expanded airport.

The community profile was based on existing secondary data sources and provided informa- tion on a range of indicators, including popu- lation, education, employment and income, hous- ing, crime and health. Areas with relatively high levels of deprivation or poor existing health were identified. The identification of such areas was important as these communities are more likely to be susceptible to health effects. Overall, the communities surrounding the existing airport were found to be relatively affluent and there were no severely deprived neighbourhoods within the study area. Performance on most health indicators was also significantly better than the national average.

A stakeholder engagement programme was under- taken as part of the HlA. This sought the views on potential health effects of those interested in or affected by the proposed development. More specifically, the engagement process sought to identify:

- stakeholder concerns regarding the project and its potential effects on health and well- being, and how to minimize such effects;
- stakeholder perception of the benefits that could arise from the project and how such benefits could be enhanced; and
- the priority issues and concerns of the stake- holder and what recommendations they would like to see noted within the HIA.

The geographic scope of engagement was similar but not identical to that used for the HIA com- munity profile. Inner and outer engagement zones were defined. The boundaries of the inner zone were based on three main factors: (a) predicted aircraft noise contours for the expanded airport;
(b) areas that could experience air quality changes; and (c) areas affected by the surface access devel- opment (traffic and construction effects). rhe outer engagement zone covered a wider area that also included those settlements that were expected to supply the bulk of the workforce for the expanded airport.

Engagement mechanisms included stakeholder interviews, workshops and a questionnaire sur- vey of local residents. The interviews and work- shops were carried out with key stakeholders repre- senting organizations with strategic responsibilities in relation to health, housing, education, business, transport and other relevant areas. Open com- munity workshops were not undertaken, as these had attracted a low level of interest from the public during the engagement process for the earlier Stansted G1 HIA (although groups opposing the development argued that the low response was due to a lack of advance publicity). Members of the public were engaged instead through a ques- tionnaire survey. This was distributed to a sample of around 9,300 households in the inner and outer engagement zones. The content of the question- naire was subject to a process of review by the
HIA team, BAA, the Health Topic Group and expert reviewers.

Key issues of concern to emerge from the stakeholder engagement included:

- air quality (particularly the potential health effects on vulnerable groups, including chil- dren and the elderly);

the scientific evidence on health effects was less certain and did not allow quantified estimates to be made. Uncertainties, data limitations and other practical difficulties encountered were clearly outlined in the method statements.

The health effects considered in the assessment included the following:

- air traffic noise; •
- road traffic/congestion;
- effects on the 'social capital' of the area (more rapid pace of neighbourhood change; loss of identity);

•

socio-economic issues (employment oppor- • tunities; inward migration of construction workers; effects on existing housing provision); • and •

•

healthcare and community facilities (adequacy 9.6.7
7 Assessment of health impacts

of existing capacity; effects on emergency • services; effects on healthcare recruitment).

There was some overlap in the issues raised with those addressed in the EIA, particularly with respect to employment and wider socio-economic • issues.

The HIA report included a series of detailed 'methodology statements' for each of the health • pathways identified in the project profile. These methodology statements describe the methods used in the HIA to determine the likely scale of • health outcomes, based on a review of the rele- vant scientific evidence (e.g. on the health effects • of specific air pollutants) and the stakeholder engagement. In most cases, the methods were dependent on input data from the £IA studies, such as predictions of the concentrations of specific
air pollutants or of air noise contours with and
Air quality: health effects associated with increases in particulate matter and NO_2 con- centrations (e.g. years of life lost; respiratory and other hospital admissions; GP consulta- tions for asthma).
Air noise: annoyance; sleep disturbance; cogni- tive effects on schoolchildren.
Ground noise: annoyance; sleep disturbance. Transport: injuries and fatalities from road and rail accidents.
Employment and income: positive effects of additional employment and income, includ- ing effects on mental health (e.g. depression), self-rated 'good health' (well-being), long-term limiting illness and mortality.
Social capital: changes in civic participation, social networks and support, social participa- tion, reciprocity and trust, and satisfaction with the area (e.g. associated with inward mig- ration of construction workers and land take), and consequent health/well-being effects.
Involuntary relocation: stress, anxiety and reduced well-being for those moving from existing residential properties due to land take. Visual effects and light pollution: reduction in well-being.
Health care and community facilities: effects on existing facilities (e.g. due to inward migra- tion of construction workforce; accidents; transmission of infectious diseases).

There was some degree of overlap with the
without the proposed development. This inter- dependence means that any weaknesses in the EIA's predictive methodologies or assumptions will also have been reflected in the HIA work (see Stop Stansted Expansion 2006 for a more detailed discussion of these issues). Most of the predicted health effects were quantified, generally by estim- ating the number of people likely to experience specific health outcomes. However, some impacts were discussed only qualitatively, in cases where
impacts considered in the £IA, although the approach adopted in the HIA was rather different, with a greater emphasis on identifying the magni- tude of effects and less focus on the evaluation of significance. For example, in relation to aircraft noise, whereas the EIA sought to identify the significance of changes in noise exposure, the HIA placed much more emphasis on quantifying the numbers of people likely to experience specific health outcomes. These quantified estimates were
compared with the prevalence of the relevant health outcomes in the local population, where such data was available. However, the significance of the estimated health outcomes was not directly assessed. The HlA report stated that this was due to a lack of recognized significance assessment criteria for these effects.
In assessing the impacts of the second runway (G2) proposals, the HIA considered the health outcomes arising in the following scenarios:

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Base case with no G2 development (in 2015 and 2030): annual passenger numbers were assumed to be 35 million in this scenario, in both 2015 and 2030.

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With G2 development, in 2015: this was the date at which the second runway was expected

to become operational.
•
With G2 development, in 2030: at this date the enlarged airport was expected to have reached its capacity of 68 million passengers per annum. 9.6.8
Mitigation and enhancement of impacts 9.6.9
9 Summary

9.7
Cairngorm mountain railway: mitigation in EIA 9.7.1
1 Introduction

9.7.2
The project

9.7.3
The EIA and planning process

9.7.4
Visitor management, mitigation and monitoring measures

Health effects arising during the construction of the second runway were also assessed. It is important to note that the base case for the assessment did not represent the situation at the time of the second runway application. Instead it was a projected baseline, which assumed that the earlier G1 planning application, to expand the capacity of the existing runway, would be approved. This resulted in a base case of 35 million passengers per annum rather than the actual baseline at the time of assessment in 2008, which was only 22 million (without approval of the GI development, annual passenger numbers would have been limited to no more than 25 million in both 2015 and 2030, and therefore a figure of 25 million might also have been used as an alternative base case). The overall increase in passenger numbers assumed in the second runway HIA was therefore 33 million (from 35 to 68 million); this represented a 94 per cent increase in annual pass- enger numbers compared with the base case.
An alternative approach would have been to consider the GI and G2 development proposals as two parts of a larger planned expansion of the airport. In this case, the resulting increase in passenger numbers would be significantly larger,
from a baseline of 22 (or 25) million to 68 million by 2030 (or an increase of 172-209 per cent). The resulting health effects would also be larger than for the G2 development alone. A consideration of the combined effects of the Gl and G2 proposals in the HIA would therefore have been useful. There was in fact no attempt to assess the combined health impacts of the Gl and G2 proposals as a whole. The health effects of the G1 development were therefore ignored in the HIA for the second runway development. Similarly, the health effects of the second runway had been ignored in the earlier HIA for the GI development proposals. This use of separate assessment processes also applied to the EIA's for both planning applications. This approach was supported by the Planning Inspector at the public inquiry into the G1 proposals, when he concluded that 'for the purposes of the EIA Regulations, I accept BAA's view that the G1 pro- posals arc not an integral part of an inevitably more substantial development' and that 'the lack of consideration of the combined impacts of the G1 and GZ proposals in the current ES does not frustrate the aims of the EIA Regulations and Directive' (The Planning Inspectorate 2008). Even if this view is

accepted with respect to the G1 development, it seems less tenable for the later G2 proposals as these clearly did now represent part of a 'more substantial development'.
The failure to include an assessment of the effects of the combined G1 and G2 expansion proposals means that identification of cumulative health effects was likely to have been deficient. rhe issues raised here are similar to those highlighted in the earlier case study on Wilton power station in Section 9.2; in both cases the use of divided project consent and assessment procedures resulted in a failure to adequately address incremental and cumulative impacts.

The HIA report provided a list of recommenda- tions to BAA, the airport's operators, for the miti- gation and enhancement of health effects. Feasible options for mitigation and enhancement measures were identified from the results of the assessment phase and the suggestions made by stakeholders.
These options were then subjected to a review by the Health Topic Group and an expert panel, before arriving at the final list of recommended measures.
The recommended mitigation measures in the HIA were relatively narrow in focus and did not include substantive changes to the actual project proposals. These were taken as a 'given' in the HIA. As the HIA notes, 'some of the effects are associated with features of the G2 project that cannot be adjusted without changing the purpose of the development itself ... Inevitably, this means that some effects are more amenable to management than are others' (ERM 2008). A number of the pro- posed mitigation measures involved suggestions for improved communication about the scale of health effects with local communities; it was also recommended that monitoring of noise levels might be better undertaken by an independent third party rather than BAA. A number of generic mitigation measures to reduce emissions and noise at source were also recommended, including, for example, introduction of increasingly stringent technical standards, improved operational practices and the progressive withdrawal of the noisiest and dirtiest aircraft. It could be argued that such measures would have been implemented even in the absence of the proposed development, and should therefore be regarded as part of the 'no-development' future baseline rather than as project-specific mitigation.
The HIA did not identify whether, and in what ways, the earlier planning and EIA work on the project had incorporated an explicit considera- tion of health impacts into the development of the project proposals and of the mitigation measures recommended in the environmental statement. The HIA report simply states that 'many of the effects on the environment (and by extension, health) have been considered very thoroughly at the planning stage where options for runway loca- tion and mode of operation were evaluated' (ERM 2008). Further information on how health effects were taken into account in the evaluation of these options, and in what ways mitigation of health effects had been incorporated into the final project proposals, would have been useful.
These limitations partly reflected the timing of the HIA work, which was undertaken following the
project design and EIA studies. This was necessary since the HIA's assessment methods were heavily dependent on data inputs from the ElA predictions, for example in relation to the predicted changes in air quality and noise levels. However, this raises questions about the overall ability of the HIA to influence the final project proposals. The timing of the assessment also explains the failure of the HIA to include any evaluation of alternative options; only the health effects of the final pro- posals, as detailed in the planning application, were assessed in the HIA. There was no consid- eration of the comparative health effects of alterna- tive designs or modes of operation. It is therefore difficult to assess whether the chosen options delivered more favourable health effects (or smaller adverse effects) for the local communities than other feasible alternatives.

This case study has provided an example of the application of health impact assessment to a major project proposal. HlA is increasingly undertaken as a parallel process alongside EIA and is often dependent on the ElA for critical data inputs. The Stansted HIA was an example of a comprehensive HIA process. Extensive stakeholder engagement was undertaken and the assessment methodology was based on a detailed review of the relevant scientific evidence. Although a wide definition of health and well-being was adopted, the focus of the assessment was restricted to effects on the local communities adjacent to the airport. This resulted in the exclusion of important issues such as the effects of climate change on health. Other issues were also scoped out of the assessment on the basis that they were the responsibility of other organizations and would be addressed in their evolving plans and strategies. By focusing only on the second runway proposals and ignoring other aspects of the Stansted expansion plans, the assessment failed to adequately consider the incremental and cumulative health effects of the airport's planned future growth. There was also no consideration of the comparative health effects of alternative project options (other than the no- development baseline), and as a result the overall level of influence of the HIA on the project proposals appears to have been limited.

It is appropriate that one of our case studies includes a tourism project, for tourism is the world's largest industry, it is growing apace and it contains within itself the seeds of its own destruction. That tourism can destroy tourism has become increasingly recognized over the last 30 years or so, with a focus of concern widening from initially largely economic impacts to a now wider array that includes social and biophysical impacts (see Glasson et al. 1995; Hunter and Green 1995; Mathieson and Wall 2004). Mountain areas can be particularly sensitive to tourism impacts, including from walking, skiing and associated facilities. This case study takes a particularly controversial project, the Cairngorm mountain railway, in the Highlands of Scotland, which was opened in 2001 after a long and protracted debate about its impacts and their management. This brief case study focuses on the latter aspect as an example of approaches to mitigation and monitoring in £IA.

The Cairngorm Ski Area is one of five ski areas in Scotland. It developed rapidly in the 1960s and 1970s in combination with the adjacent settlement of Aviemore. Chairlift facilities were built to take skiers to the higher slopes in winter, and also to carry walkers in other times of the year. However, the industry has been vulnerable to climate/ weather trends and to the quality of the infrastruc- ture. In 1993 the Cairngorm Chairlift Company published a Cairngorm Ski Area Development Plan designed to upgrade facilities, to give better access to reliable snow-holding in the area, to reduce vulnerability to adverse weather conditions, to improve the quality of visitor experience and to improve economic viability, while ensuring that all relevant environmental considerations were taken fully into account. The Cairngorm Funicular Railway was a key element in the plan.

The Cairngorm Funicular is the UK's highest and fastest mountain railway. It is approximately 2 km in length and takes visitors in eight minutes from the existing chairlift station/car park base at Coire Cas (610 m) to the Ptarmigan top station (1100 m). It comprises two carriages (or trains of carriages) running on a single-line railway track between two terminal points (see Figure 9.3). The carriages, which start at opposite ends of the track, are connected by a hauling rope. As one carriage descends the track, the other travels upwards and they pass each other at a short length of double track midway. The track is carried on an elevated structure, a minimum of I m and a maximum of 6 m above ground level. The final 250 m runs in a 'cut and cover' tunnel. The development has also included a major remodelling of the existing chairlift base station, and replacement of the existing top station with a new development, which includes catering facilities for about 250 people, and a new interpretative centre, includ- ing various displays and an outdoor viewing terrace. The previous chairlift and towers have been removed as part of the development. It was anticipated that the railway would carry approx- imately 300,000 visitors a year, with two-thirds in the non-skiing months. This would represent a three- to fourfold increase over 1990s numbers reaching the top station by the chairlift, and a doubling of numbers from the early 1970s.

The original planning application for the Funicular Railway was submitted in 1994, with an ES (Land Use Consultants I 994). Revised proposals and a supplementary ES were submitted in early 1995. The scheme was very controversial, with much opposition. Particular concerns focused on the potential impact of improved visitor access to the sensitive environment of the summit plateau, which is recognized as a European candidate Special Arca of Conservation and an SPA. As a condition of the planning approval, it was necessary for the developer to satisfy Scottish Natural Heritage (SNH, the statutory body responsible for nature conservation in Scotland) that a visitor manage- ment plan (VMP) and other mitigation measures would be put in place that would avoid adverse impacts on the summit plateau.

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Figure 9.3

(a) Cairngorm mountain railway; (b) the wider environment

Source: HIE 2005

The planning application was approved by the Highland Council (the consenting authority) in 1996. This was subject to a Section 50 (now Section 75) planning agreement to create, in partnership with the SNH and in agreement with the developer/authority, a regime for visitor and environmental monitoring and management. Amended designs for the station buildings were approved in 1999, and construction work finally began in August 1999. The railway opened in December 2001, following the approval of the proposed VMI' by SN! I.
The Section SO agreement attached to the planning approval is a legally binding agreement between the planning authority, in partnership with SNH, and the developer/operator and landowner. The agreement provides for:

a baseline survey of current environmental conditions and visitor usage in the wider locality;
an implementation plan providing details of the timing and means of implementation

of the development with particular reference to reinstatement following construction;

- an annual monitoring regime to identify chan-

ges and establish causes and consequences;

- an annual assessment by the operator of any actions necessary to ensure acceptable impacts to the European designated conservation sites on the summit plateau;
- fall-back responsibilities in the event of default; and
- eventual site restoration if public use of the development ceases (Highland Council 2003). 9.7.5 Conclusions

9.8 SEA of UK offshore wind energy development 9.8.1 Introduction

9.8.2 Development of offshore wind energy in the UK

rhe Cairngorm Funicular Railway VMI' was produced in the context of this agreement. The objective of the VMP is to protect the integrity of the adjacent areas that have been designated or proposed under the European Habitats and Birds Directives from the potential impacts of non-skiing visitors as a direct consequence of the funicular development. The VMP went through several stages and was subject to a short period of public consultation in 2000. Many issues were raised, including the innovative or repressive (according to your perspective) 'closed system', and the associ- ated monitoring arrangements (SNH 2000).
The closed system, whereby non-skiing visitors are not allowed access to the Cairngorm plateau from the Ptarmigan top station, is a key feature of the VMP. Instead visitors must be content with a range of inside interpretative displays and access to an outside viewing terrace - plus, of course, shopping, catering and toilet facilities! This system proved very contentious, and received consider- able criticism, in the public consultation on the VMP. Some saw it as

violating the freedom to roam; for others, it was a cynical device for extracting economic benefit in shops and catering outlets. Others considered it unnecessary, given the recent improved pathway from the Ptarmigan top station to the summit of Cairngorm, as noted by one respondent: 'For years I have been advocating stone paths. People use the paths and the ground round about recovers. Now that the path up to the sum- mit is pretty well complete most people will be barred from using it!' (SNH 2000). Another issue has been how to allow ingress to the facilities of the top station from non-railway-using walkers on the plateau, while preventing egress from non-walkers. Alternatives were suggested at the time to the
closed system including ranger-led walks and time- limited access, but the system was put in place and is part of a 25-ycar agreement. J'hc guide leaflet for the funicular users includes the following:

Protecting the Mountain Environment: large areas of the fragile landscape and habitats of the Cairngorms are protected under European Law. Cairngorm Mountain Limited is com- mitted to ensuring that recreational activities are environmentally sustainable. For this reason the Railway cannot be used to access the high mountain plateau beyond the ski area at any time. Outwith the ski season, visitors are required to remain within the Ptarmigan building and viewing terrace, returning to the base station using the rail- way. ountain walkers arc welcome to walk from the car park and use the facilities at the Ptarmigan, but may not use the railway for their return journey and are asked to sign in and out of the building at the walkers' entrance.

Monitoring can support effective mitigation measures. For this project, monitoring covers all topics subject to baseline surveys - including visitor levels and behaviour, habitats, birds, soils and geomorphology. It uses the limits of acceptable change (LAC) method, whereby indicators and levels of acceptable change are identified, moni- tored and, when levels are reached, management responses can be triggered (sec Glasson et al. 1995). In response to a concern about the independence of the monitoring activity, the annual monitoring reports are presented to the SNH and the Highlands Council by an independent reporting officer jointly appointed by them.

The Cairngorm Funicular has been operational for over 10 years. Visitor numbers have been less than the predictions in the ES, but still represent a substantial increase on previous levels in the 1990s. Conditions have been complied with, the Section 50 (75) agreement has been secured, and a good working partnership has been established between public authorities and the operator; there is access for all abilities to the Ptarmigan top station, an
improved footpath system and the old White Lady chairlift system has been removed. Recently provision has been made for small groups of up to 10 visitors, including mountain railway passengers, to enjoy a 90 minute guided walk on a mountain trail path to the summit, outside the skiing season, every day between May and September.

This case study provides an example of the application of SEA to plans and programmes at a national level. It concerns the SEA of the UK government's plans for the future development of offshore wind energy. The SEA was carried out during 2002-03, prior to the implementation of the EU SEA Directive (2001/42/EC). Further information on the requirements of this Directive, and on SEA more generally, can be found in Chapter 11.
The context for this particular example of SEA was ambitious government targets for renewable energy generation, linked to the achievement of the UK's commitments in the Kyoto Protocol to significantly reduce CO2 emissions. At the time of the SEA (2002-03), the UK government was committed to supplying 10 per cent of electricity needs from renewable sources by 2010, rising to 20 per cent by 2020. Offshore wind energy was seen as a major contributor towards these targets (DTI 2003a), and the UK government wished to see rapid development of the industry. But it was also committed to an SEA process, which was intended to influence decisions on which areas of the sea should be offered to developers (and which should be excluded), as well as to guide decisions on bids for development licences sub- mitted by individual developers. At the time, off- shore wind energy was a new industry undergoing rapid development, and there were therefore many uncertainties about environmental impacts, including potential cumulative effects. This pre- sented difficulties for the SEA work.
The development of offshore wind energy in the UK involves separate licensing and consent systems. The licensing system is operated by the Crown Estate, in its role as landowner of the UK sea bed. Licensing takes place under a competitive tendering process in which developers submit bids for potential wind farm sites. It is left to the developers themselves to identify potential sites, from within broad areas defined by the Department of Energy and Climate Change

(DECC, previously DTI). The developers submitting successful bids are then offered an option on their proposed site. Detailed technical studies, consultation and EIA work on the site is then undertaken by the devel- oper, prior to the submission of a consent applica- tion. The necessary planning consents are granted by DECC and DEFRA, following consultation with the Ll'As most closely affected, statutory consultees and the public. Once the necessary consents have been obtained, developers are granted a lease of 40-50 years on the site and can then begin con- struction of the wind farm.

In the UK, the Crown Estate's first invitation to developers for site leases for offshore wind devel- opment (Round 1 of licensing) took place in 2001. This resulted in 18 planned developments, each of up to 30 turbines. Most of these schemes obtained planning consent in 2002-03 and were installed from 2003 onwards. After this first round of licensing, the government published 'Future offshore', a document setting out its plans for the second licensing round (DTI 2002). This envisaged much larger developments than in the previous round, and stated that future development was to be focused in three 'strategic areas' - the Thames Estuary, the Greater Wash and Liverpool Bay (Figure 9.4). These areas were selected as having the greatest development potential, based on the potential wind resource available, the bathymetry of the offshore area, proximity to existing grid connections and initial expressions of interest from developers (DTI 2003b); however, environmental constraints appeared to have had less influence on the choice of strategic areas.

A three-month consultation period on the 'Future offshore' document started at the end of 2002. The SEA of the government's plans for Round
2 licensing, which is the focus of this case study, started at the same time, with the resulting SEA Environmental Report submitted in May 2003 (for a 28-day consultation period). Despite this SEA process, the government was keen to maintain the pace of development in the offshore wind energy industry, and the deadline for developers to submit expressions of interest for Round 2 site leases to the Crown Estate was the end of March 2003 (i.e. prior to the completion of the SEA Environ- mental Report or the receipt of consultation res- ponses on this report).

The successful bids for Round 2 developments were finally announced in December 2003. These included 15 projects with a total capacity of between 5.4 and 7.2 GW - this compares with the 1.2 GW consented under Round 1, and so repre- sented a step change in the development of the industry in the UK. Some of the selected sites soon proved controversial, with concerns about the potential impacts on important bird habitats raised by the RSPB (2003).

Figure 9.4

Map of the three strategic areas for offshore wind farm development (Round 2)
The SEA in this case was of the UK government's draft programme for the second licensing round of offshore wind energy development. The SEA •
was commissioned by the DTI voluntarily, in
accordance with the requirements of the EU SEA Directive (although this had not yet been imple- mented at the time). The timescale under assess- •
ment was from 2003 until 2020, with separate
assessments undertaken of development up to 2010 and 2020 (OT! 2003a). Two potential develop-
The identification of locations within the three strategic areas (the Thames Estuary, the Greater Wash and Liverpool Bay) with the lowest levels of constraint.
The significance of the environmental and socio-economic impacts arising from different realistic scales of wind farm development in those areas with the lowest levels of constraint.
Recommendations for managing the impacts of wind farm development in the three strategic areas.
ment scenarios ('likely' and 'maximum credible') were considered and their likely impacts assessed. The 'likely' scenario envisaged the development of 4.0 GW of capacity by 2010, while the 'maxi- mum credible' scenario envisaged 7.5 GW. By 2020, these figures were expected to increase to 10.2 and 17.5 GW respectively. A no-development option was also considered.
A steering group was used to guide the SEA process, with membership drawn from special- ists in coastal/marine environmental issues, wind energy development and SEA. Steering group members included representatives from relevant government departments (DTI, DEFRA, ODPMJ; the Crown Estate; the British Wind Energy Associ- ation (BWEA), the body representing the UK wind energy industry; government and non- governmental environmental organizations, such as the RSPB, Joint Nature Conservancy Council ONCC), Countryside Council for Wales, and EN; and the IEMA, the body representing the UK EIA 'industry'.
Consultation was undertaken on the scope and design of the SEA. A scoping workshop was held towards the end of 2002 and a scoping report was produced. Some changes to the scope of the SEA were introduced as a result of the consultation responses received, for example by including a wider range of socio-economic impacts that had been identified as important by a number of consultees (DTI 2003a). The environmental report produced at the end of the SEA process provided information on:

- The nature and extent of the technical, envir- onmental and socio-economic constraints that may preclude or be affected by wind farm development.

Overall, it was concluded that:

The likely development scenario, to 2010, is achievable for each Strategic Area without coming into significant conflict with the main significant impact risks, namely areas of high sensitivity to visual impact, concen- trations of sensitive seabirds, designated and potentially designated conservation sites, MoD Practice and Exercise Areas and main marine traffic areas. !However!, the 2020 likely development scenario would only be achievable subject to resolving the uncertainties concerning impacts on: physical processes, birds, elasmo- branchs (shark, skate and ray species) and cetaceans.
The maximum credible scenario for all Strategic Areas, particularly the Greater Wash and Thames Estuary, for 2020, may be compromised by constraints, particularly cumulative impacts and conflict with marine traffic (commercial and recreational naviga- tion); and large scale development could exclude fisheries from significant areas of fishing grounds, particularly if it were to coincide with severance areas associated with other offshore activities. (DTI 2003a)
In order to minimize environmental impacts, the following broad strategic approach was recommended:

- The development of fewer large wind farms, of around 1 GW (1,000 MW) or more capacity,

located further offshore is generally preferable to several small-scale developments, though the latter would be preferable for development closer to the coast.

- In all strategic areas, avoid the majority of development within the zone of high visual sensitivity close to the coast.

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Where development might occur close to the coast, preferentially select low constraint areas and consider small-scale development.

- Pending the outcome of monitoring studies, avoid development in shallow water where birds such as common scoter and red-throated diver, and other species (including marine mammals) arc known to congregate (particu- larly in Liverpool Bay and the Greater Wash).

- Address the uncertainties of large-scale im- pacts, particularly cumulative effects, at a strategic level (DTI 2003a). 9.8.4
SEA methods •
existing and planned licensed areas for aggregate extraction, waste disposal and military operations;

- oil and gas structures (pipelines) and safety zones;

- cultural heritage sites (wrecks and other sea bed obstructions);

- cables;

- existing shipping/navigation lanes; and

- proposed wind farm sites from the first round of licensing. •
shipping;

- fishing effort; and

- shell-fishery areas. Environmental constraints:

- marine habitats of conservation interest (designated and potentially designated);

- seascape sensitivity;

- fish spawning areas; and

- fish nursery areas.

l'hc environmental report was subject to a short period of public consultation (28 days). The government argued that the report and the comments received would be 'a significant input to government decision-making on the nature of the second licensing round' (DTI 2003a).

It must be accepted that, in an SEA, the level of detail that can be analysed and presented, in respect of both baseline data and quantification of impacts, is less than in a project-level

EIA. This was true of this particular SEA, which 'focuses more on assessing constraints, sensitivities and risks instead of detailed analysis of the characteristics of specific impacts' (DTI 2003a). The methods used in the SEA included a GIS-based spatial analysis (constraint mapping exercise), followed by a risk-based analysis of the likely impacts of the selected development scenarios (including the cumulative implications). Each of these methods is described briefly below, with selected examples included to illustrate the approach used.

Spatial analysis

The spatial analysis made use of electronic overlay mapping of a variety of technical, socio-economic and environmental features to identify areas of the sea with high or low constraints within each of the three strategic areas. Examples of the main features mapped are listed below:

Technical constraints to wind farm development:

Socio-economic constraints:

Because of baseline data limitations, not all relevant constraints could be mapped within the relatively tight timescale of the SEA. In particular, it was not possible to map a number of important environmental constraints, such as the distribution of certain bird and fish species and migration routes. Whether these omissions invalidate the conclusions drawn from the constraint mapping exercise is open to question (see below for a summary of consultation responses on this issue). However, those factors that could not be mapped were considered in the later risk-based analysis of impacts.

A scoring system was used in the mapping of constraints, in which each area was awarded a score between 0 and 3 for each mapped constraint (with higher scores indicating greater constraints). The scoring system allowed the identification of locations within each of the three strategic areas that had several constraints (a high total score) and those with fewer overall constraints (a lower overall score), subject to the qualification that not all relevant constraints could be mapped (see Table 9.1). Broad conclusions from the spatial analysis are summarized below, for each strategic area (DTl 2003a):

- Liverpool Bay. Overall, the greater amount of constraint and sensitivities occured in the southern part of this strategic area, due to the presence of bird interests, marine habitats of conservation interest, seascape, fisheries and marine traffic. Seascape constraints in the north of the area were significant.

- Greater Wash. The Greater Wash had the largest area of low constraint in comparison with the other strategic areas and offered the greatest potential capacity for wind farm devel- opment. Inshore areas, particularly in the southern part of the area, had the greatest amount of constraint and sensitivity, particu- larly with respect to visual impacts, inshore fisheries, marine mammals, birds and offshore habitats of conservation interest.

- J1111mes Estuary. rhis region included areas of low constraint on its eastern boundary, and had fewer environmental constraints than the other strategic areas. However, several estuaries and marshes were important bird habitats. Commercial activities (e.g. aggregate extraction) and recreational navigation were other important constraints.

Tab le 9.1 Scores for mapping of constraints Scores for fishing ettort

0	None
1	Low {less than 500 hours per annum}
2	Medium (500-5,000 hours per annum)
3	High {over 5,000 hours per annum}

Scores for designated habitats of conservation interest
0
Designated habitats are absent

1
Not applicable

2
Nationally important habrtats are present (including those not yet designated}

3
Internationally important habitats are present (including those not yet designated)

Scores for seascape
0
No sensitivity

1
Low sensitivity

2
Medium sensitivity

3
High sensitivity 9.8.5
Issues raised in consultation responses

Risk-based analysis of impacts
For each strategic area, the likely impacts of the two development scenarios ('likely' and 'maximum credible') were assessed. This analysis incorporated factors that were mapped as part of the earlier spatial analysis, plus specific receptors that could not be mapped, such as particular bird species. Impacts were quantified wherever possible, or otherwise described qualitatively, and their signifi- cance evaluated using a risk-based approach. This was based on an assessment of (a) the likelihood of the impact occurring, and (b) the expected con- sequences (impact on the receptor). As with the spatial analysis, a scoring system was used in the evaluation of impact significance, as shown in Tables 9.2 and 9.3 (DTI 2003a).
The impact significance scores for each impact were calculated as the product of the consequence and likelihood scores, ranging from 1 (minor consequence and unlikely) to 25 (serious consequence and certain).

The environmental report produced at the end of the SEA process was subject to a short period of consultation. An analysis of the consultation

Table 9.2 Scores for impact consequence

5 Serious {e.g. impacts resulting in irreversible or long-term adverse change to key physical and/or ecological processes; direct loss of rare and endangered habitat or species and/or their continued persistence and viability)
3 Moderate (e.g. impacts resulting in medium-term (5-20 years} adverse change to physical and ecological processes; direct loss of some habitat (5-20 per cent}; crucial for protected species' continued persistence and viability in the area and/or some mortality of species of conservation significance}
Minor {e.g. impacts resulting in short-term adverse change to physical and ecological processes; temporary disturbance of species; natural restoration within two years requiring minimal or no intervention}
0 None {e.g. impact absorbed by natural environment with no discernible effects; no restoration or intervention required)
+ Positive {e.g. activity has net beneficial effect resulting in environmental improvement)

Table 9.3 Scores for impact likelihood

5 Certain (the impact will occur)

3 Likely (impac1 is likely to occur at some point during the wind farm life cycle)
Unlikely (impact is unlikely to occur, but may occur at some point during wind farm life cycle)
•

responses reveals a number of key issues that were raised by interested stakeholders. These include a range of concerns about the quality and effec- tiveness of the SEA process, and its influence on decisions for the next phase of wind energy developments. Many of these concerns arose from • the tight timescale for the SEA work and the resulting practical difficulties encountered. The main points raised in consultation arc highlighted briefly below (a fuller discussion can be found in DTI, 2003b). Many of the issues raised are interlinked; for example, weaknesses in baseline data may be due to limited consultation or a tight • timescale in which to complete the SEA.

- Pre-selection of the three strategic areas, and lack ofa national-level SEA. The three strategic areas in which Round 2 development was to be focused were selected as having the greatest development potential, based on the potential wind resource available, the bathymctry of the offshore area, proximity to existing grid connections and initial expressions of interest from developers (DTI 2003b). However, the selection did not appear to have taken explicit account of environmental constraints, and this was a cause of concern to a number of respondents.

- The tight ti111escale for the sea and uncertainty over the influence of the SEA process 011 decision- making for future developments. The timescale for the SEA was considered too tight to allow effective stakeholder engagement and con- sultation, or to allow additional baseline data

to be collected. The fact that developer bids • for Round 2 sites were invited before the completion of the SEA Environmental Report was also a source of concern.

- Concern over the rapid development of offshore wind energy, prior to the proper consideration of

potential impacts. Some respondents argued that the development of the offshore wind energy industry was too rapid and premature; greater efforts should be made to understand the impacts of the smaller Round 1 develop- ments before allowing large-scale expansion of the industry.
The need for clearer locational guidance. There was felt to be a need for clearer recommen- dations on suitable and unsuitable locations for future offshore wind energy development (including the definition of exclusion zones or 'no-go' areas), and it was considered that these had not emerged sufficiently from the SEA process.
Concerns about the scope and methodolosy of the SEA. Most respondents were supportive of the overall methodology of the SEA, including the risk-based approach to the assessment of impact significance, but there was some disagreement over the detailed scores awarded to specific receptors or geographical areas.
Weaknesses in the available baseline data. A recurrent theme in the consultation responses was limitations in the baseline data available to the SEA study. This included missing data for certain important environmental constraints (which could not be mapped) and areas in which the data used in the SEA was not the most accurate or appropriate. Some respondents thought that these data limita- tions were sufficiently serious as to invalidate the identification of areas of high and low constraints in the SEA. Data gaps and uncer- tainties about impacts also led respondents to urge a precautionary approach; the need for such an approach was also strengthened by ongoing delays in the designation of off- shore areas of conservation interest under the EU Habitats Directive. Other uncertainties in- cluded doubts about whether the impacts of smaller wind farms (from the first round of licensing) could

necessarily be extrapolated to larger wind farms further offshore.
Limited consultation with certain stakeholders.
According to some respondents, the SEA had involved only limited consultation with certain stakeholders (e.g. fisheries and recre- ational boating interests). This Jack of con- sultation, again partly linked to the tight timescale for the exercise, helped to explain some of the data weaknesses on certain issues in the SEA.

- lnsufficic:11t attention to rn11111/ative and indirect

effects. It was considered that insufficient attention was given to the impact of related onshore development in the SEA, such as transmission connections. This concern echoes the issues highlighted in the first case study in Section 9.2. More attention also needed to be devoted to cumulative impacts in the environmental report. There was no indication in the report of the carrying capacity of each of the strategic areas, and it was therefore difficult to assess the significance of the cumu- lative impacts arising under the two develop- ment scenarios.

- Overlaps with project-level EJA. l"here was some disagreement over the level of detail needed in the SEA, and which issues could be left to project-level EIA for individual sites. Fur example, bird distribution data was considered to be one area in which survey data could reasonably be collected at a more strategic level.

- Responsibility for fi1t11re SEA studies. Some respondents requested clarification about who would be responsible for progressing further studies arising from the SEA, including addi- tional data collection to fill existing data gaps and ongoing monitoring. Arrangements for the sharing of such data were felt to be important. 9.8.6
Summary

9.9
SEA of Tyne and Wear local transport plan 9.9.1
1 Introduction

9.9.2
Background to the plan

9.9.3
Overview of the SEA process

This case study of SEA was undertaken volun- tarily, prior to the implementation of the EU SEA Directive. It provides an example of how SEA can be applied, within the context of a new, rapidly developing industry. The UK government's com- mitment to large-scale development of offshore wind energy to meet international obligations to reduce CO_2 emissions dictated a tight timescale for this SEA. However, the resulting limitations in baseline data, and restricted timescale for stake- holder consultation and feedback, were identified as particular weaknesses in this case.

This case study concerns the SEA of the Local Transport Plan for Tyne and Wear, a metropolitan sub-region in the northeast of England. The case study is interesting in that it provides an example of an integrated form of assessment, in which an attempt was made to incorporate the results of various other types of assessment into the SEA process. These include health impact assessment (HIA), equality impact assessment (EqlA) and habitats regulation assessment (HRA). The assess- ment of alternative options is an important feature of SEA and this is therefore also a particular focus of the case study.
Local transport plans (LTPs) were introduced as a statutory requirement in England by the Transport Act 2000. This required local transport authorities to prepare a Local Transport Plan

every five years and to keep it under review. Under the terms of the Act, LTPs are required to set out the authority's policies 'for the promotion and encouragement of safe, integrated, efficient and economic transport facilities and services to, from and within their area'. LTPs cover all forms of transport (passenger, freight and pedestrian; public and private) and include strategic policies and an associated implementation or delivery plan outlining more detailed proposals.

The case study concerns the third local transport plan (LTP3) fur the Tyne and Wear metropolitan area. The LTP comprises a strategy covering 2011-21, supported by a delivery plan for the first three years of this period (Tyne and Wear Integrated Transport Authority 2011). The plan was prepared during 2010-11, with a parallel SEA process undertaken (Tyne and Wear Joint Transport Working Group 201la, b). SEA of LTPs is a statutory requirement under the UK's SEA Regulations. Guidance from the UK Department for Transport (DfT) also indicates that there is a requirement for HIA and EqlA for LTPs (Dff 2009a, b). For the Tyne and Wear LTP, an attempt was made to integrate these assessments within the SEA.

Tyne and Wear is a city-region in the northeast of England, encompassing an urban core plus a more rural hinterland. The area includes the major urban centres of Newcastle-upon-Tyne, Gateshead and Sunderland, and has a population of 1.1 million. Tyne and Wear has suffered from historic economic weaknesses and this is currently reflected in high levels of unemployment, below average income levels, deprivation, and related social and health problems. There are relatively low levels of car ownership in the area and higher than average levels of public transport use. Two main trunk roads, the Al and Al9, serve the region. Public transport includes the Tyne and Wear Metro (light rail) system, an extensive bus network, the North Shields to South Shields cross-Tyne ferry and local rail services to the Gateshead MetroCentre (a major retail and leisure complex) and Sunderland.

The LTP was intended to help address key challenges facing the area. rhese included the need for economic development and regeneration, the need to meet climate change targets for emissions reductions, the need for safe and sustainable communities, and protection and enhancement of the natural environment. In response to these challenges, the plan adopted a strategic frame- work based on three broad intervention types: (1) managing the demand for travel (including encouragement of modal shift towards more sustainable travel modes); (2) management and further integration of existing networks (with a particular focus on the encouragement of active travel modes and public transport); and (3) targeted new investment in key schemes (including, for example, investment in electric vehicles, bus corridor improvements and new park and ride schemes).

The SEA of the local transport plan was under- taken by consultants Atkins for the Tyne and Wear Integrated rransport Authority, the local transport authority responsible for the Tyne and Wear sub- region. Key stages in the process included:

- Scoping, baseline studies and SEA methods: this involved determining and consulting on the scope of the SEA; baseline and contextual studies; and development of the SEA method- ology, including the identification of a set of appropriate SEA objectives to be used in the assessment.
- Assessment of alternatives: the development of strategic alternatives and their appraisal against the SEA objectives.
- Assessment of the effects of the draft plan: assessment of the effects of the policies in the draft plan; recommendations for mitigation or enhancement of impacts; and publication of the results of the assessment in an Environ- mental Report.
- Consultation on the draft plan and Environ- mental Report: followed by revisions to the draft plan as appropriate and publication of the final plan.
- Monitoring the effects of plan implemen- tation.

An interesting feature of the SEA was its attempt to integrate other types of assessment within the SE/\ process. These included HI/\, EqIA and HRA. Relevant government guidance states that HIA and EqIA arc required for I:rl's, although these assessments do not necessarily need to be formally incorporated within the SEA (DfT 2009a). HRA is an additional statutory requirement in cases in which a plan contains proposals that are likely to have a significant effect on a Special Protection Area or Special Area of Conservation (collectively known as Natura 2000 sites).

Impacts on human health are identified in the SEA Directive as one of the environmental topics to be considered in SEA. The requirement for a specific HIA in the government guidance on LTPs reflects the understanding that LTP policies and proposals may impact on factors influencing the health of communities and individuals. This could include for example changes in the accessibility and affordability of transport, levels of physical activity, air and noise pollution, personal safety (or perception of safety) and community severance. For the Tyne and Wear LTP, a separate HIA process was not undertaken; health considerations were instead fully integrated within the SEA process. This integration of health considerations took place at all stages in the SEA process and included, for example:

- involvement of the local NHS Primary Care Trust and other relevant public health organ- izations in the consultation on the scope and methods of the SEA;
- inclusion of health-related plans and program- mes in the review of the policy context for the plan and in the identification of key sustainability issues;
- inclusion of relevant health indicators in the baseline data collection; and
- inclusion of a specific SEA objective on health ('to improve health and well-being and reduce inequalities in health').

9.9.4 Scoping and baseline studies

9.9.5 SEA method and objectives

9.9.6

6 Identification and assessment of alternatives

- no additional interventions in public transport, highway management, cycling and walking or freight and ports;
- highway capacity schemes that are already underway or have confirmed funding to go ahead;
- bus and metro fares to increase;
- rail and metro refurbishment; and
- workplace and school travel planning to remain at current levels.
- emphasis on highway capacity schemes (mainly junction improvements);
- development of three new park and ride schemes;

EqIA involves an assessment of the impact of policies, strategies or plans on different social groups. Its purpose is to ensure that the plan does not discriminate against particular groups and where possible promotes greater equality. The Eq!A of the Tyne and Wear LTP was undertaken as a parallel exercise to the SEA and its results were reported separately (Tyne and Wear Joint Transport Working Group 2011c). However, equalities issues were also fully integrated into the various stages of the SEA in the same ways as for health consid- erations. A specific SEA objective on equality was also included in the SEA Framework ('to promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society'; the SEA Framework is discussed further in Section 9.9.5).

The Tyne and Wear LTP was also subject to HRA screening. As with the EqIA, this was undertaken as a parallel process to the SEA and reported separately, although the findings were incorporated in the SEA environmental report. The impact on Natura 2000 sites was also included as a specific SEA objective ('to protect and where possible enhance the European sites').

The topics assessed in the SEA were based on the list of factors identified in the SEA Directive. These included impacts on biodiversity, population, human health, fauna and flora, soil, water, air, noise, climatic factors, material assets, cultural heritage and landscape. As part of the scoping stage, a Scoping Report was produced and com- ments invited from statutory and other consultees (including those representing public health, equal- ity and diversity interests). The Scoping Report included contextual information on other plans, policies and programmes relevant to LTP3, initial baseline information, a summary of key environ- mental, social and health issues emerging from the initial work and a preliminary framework of objectives to be used in the SEA assessment process. A scoping workshop was also held in order to gather additional information and discuss the key issues and proposed SEA objectives (these objectives are discussed further in Section 9.9.5).

Baseline studies for the SEA included a review of the policy context, collection of a detailed evidence base on the state of the environment and identification of key environmental issues. Establishing the policy context to the LTP involved a review of other relevant plans and programmes, including those related to health and equality issues. This allowed identification of key themes and policy objectives, for environmental, health and equality-related issues. Detailed baseline information was collected on the current state of the environment and its likely evolution without the implementation of the plan. Baseline data collected included both environmental and social indicators, the latter including data on health, inequality, connectivity and accessibility.

Baseline data gaps and limitations were not explicitly identified in the SEA Environmental Report. It was therefore not clear whether potential indicators had been excluded due to a lack of baseline data. Consultation responses to the draft Environmental Report from one of the statutory consultees also included some criticism of the completeness and consistency of baseline data (including data on biodiversity, agricultural land quality and flood risk zones). The SEA consultants acknowledged these deficiencies, but stated that they could not be addressed due to 'budgetary constraints'. For a number of baseline indicators, there was also an unavoidable reliance on some- what dated sources of information (e.g. 2001 Census data, which was almost l 0 years out of date at the time of the assessment).

The baseline information and review of the policy context was used to identify a list of key environmental issues for the plan area. These covered a wide range of economic and social sustainability issues (e.g. the historic economic weakness of the sub-region and related social issues, including deprivation, child poverty, low incomes and low levels of car ownership}, as well as environmental issues (e.g. poor air quality, noise, water quality, climate change, biodiversity threats, heritage and landscape character change). Problems of general health and health inequalities were also identified as key issues. Other issues were directly related to transport (e.g. congestion, accessibility and road safety).

A key part of the assessment methodology was the development of an 'SEA framework'. This framework comprised a series of SEA objectives and associated indicators that were used in the assessment of the effects of the draft plan and of alternative options. The SEA objectives were developed through an iterative process, based on the review of relevant plans and programmes, the evolving baseline information, the key sustain- ability issues identified and consideration of which of these issues could potentially be addressed by the LTP. The list of objectives incorporated specific health, equalities and habitats issues. This was designed to ensure the integration of the HlA, EqIA and HRA screening processes within the SEA, while also meeting the requirements of the SEA Directive. A final list of 16 SEA objectives was drawn up, covering air quality, biodiversity, European sites, climate change, tlood risk, resource use and waste, water quality, use of land, historic and cultural heritage, landscape and townscape quality, accessibility and community severance, noise and light pollution, health and well-being, equality, road safety and crime. For each of these objectives, the SEA framework provided a set of associated indicators (to measure performance against the objective) and a list of assessment 'prompt questions' (to guide the assessment of the effect of LT!' policies or proposals on this objective). An example of these prompt questions and indicators, for the SEA objective on local air quality, is provided in Table 9.4.

Where possible, the indicators in the SEA framework were similar to those used in the earlier baseline studies. Analysis of the baseline situation for these indicators provided a means of summa- rizing current environmental conditions and predicted future trends (without implementation of the plan). This analysis was carried out for each of the SEA objectives using a simple three-point normative scale to describe both current conditions (good, moderate or poor) and expected future trends (improving, stable or declining). The overall conclusion was that, without the implementation of the plan, performance against a number of the SEA objectives was predicted to decline. These objectives included those relating to air quality, transport related CO2 emissions, noise and light pollution, the resistance of transport infrastructure to climate change and flood risk, and crime levels.

The SEA Directive requires a consideration of 'reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme' and 'an outline of the reasons for selecting the alternatives dealt with'. for the Tyne and Wear LTP SEA, three broad strategic alternatives were considered. These comprised a 'do-minimum' scenario, a so-called 'realistic' scen- ario and an 'optimistic' (or aspirational funding) scenario. These alternative scenarios were devel- oped by the LTP team in response to the identified local transport objectives and challenges. The main differences between the alternative options are summarized below.

no-111i11i11111111 scenario:

Realistic scenario:

Table 9.4 Extract from SEA framework for Tyne and Wear LTP3 SEA

Prompt questions for air quality SEA objective: will LTP proposals	Suggested indicators to measure performance agamst SEA objective
- Reduce traffic levels and promote more sustainable transport patterns across the area, particularly focusing on areas with low air quality (e.g. Air Quality Management Areas)?	- Levels of main pollutants for national air quality targets
- Promote walking and cycling and improve infrastructure for these forms of travel?	- Number of residential properties within AOMAs
- Encourage Green Travel Plans and school travel plans?	
- Promote operation of the most modern vehicles, including buses and private cars?	
- Recognize the importance of awareness and marketing	

- Number of Euro engine buses operating in AOMAs/future AOMAs in Tyne and Wear
- Effective use of awareness and marketing campaigns - percentage of the population reached by awareness campaigns
- Number of business and School Travel Plans
- Reduction in NO_x and primary PM_{10} emissions through local

campaigns promoting the issue of improving air quality in the region? authority's estate and operations (National Indicator 194)

- Reduce congestion on the inter-urban trunk road network in large urban areas?
- Instigate financial incentives and measures on the basis of

the polluter pays principle (e.g. congestion charge, road pricing)?

- Promote the use of public transport?

• bus priority lanes to be provided at eleven locations;
• integrated 'smart' ticketing on public transport;
• electric vehicle charging points; and
• emphasis on walking and cycling initia- tives.

Optimistic scenario (as for realistic scenario, plus the following):

• much greater emphasis on highway capacity schemes;
• development of a further eleven park and ride schemes;
• provision of an additional nine bus priority lanes;
• greater emphasis on rail and metro, including re-opening a number of rail lines; and
• no additional emphasis on walking and cycling initiatives.

The SEA Environmental Report provided only limited information on the reasons for the selection of these particular alternatives. For example, it was not clear whether other strategic options had
been considered at an earlier stage in the plan preparation process and subsequently rejected. The realism of the optimistic scenario (based on aspirational funding levels) at a time of signifi- cantly reduced public funding for transport schemes could also be questioned.
In order to compare the impacts of these alternative strategies, a qualitative assessment was made of their performance against each of the objectives in the SEA framework. This assessment was based on the series of assessment 'prompt questions' defined in the framework. Use was also made of constraint mapping, with a range of maps produced showing relevant environmental con- straints and selected schemes overlaid where specific locations were known (e.g. park and ride scheme locations). The assessment of the effects of the alternatives on the SEA objectives was a qualitative exercise, employing a simple seven point scale (large, moderate or slight beneficial effect; neutral or no effect; slight, moderate or large adverse effect). Moderate or large effects were deemed to be significant. The conclusions on the likely scale of effects on each SEA objective were supported by a detailed commentary or explanation in the environmental report. However,
there was no use of explicit significance criteria to guide this process; such criteria have proved useful in other SEAs of local transport plans and would have helped to more clearly justify the conclusions on significance in this case (see TRL 2004 for an example of the application of such criteria).
Evaluation of significance is of course often difficult in SEA of strategic plans due to the lack of detail about specific schemes, locations and timescales. In this case, there was also a difficulty in balancing the short-term and longer-term effects of the different strategies. For a number of SEA objectives, there was expected to be a mix of short- term adverse effects (e.g. associated with the construction of new infrastructure schemes) and potential longer-term benefits (e.g. due to reduced traffic and congestion levels once the schemes were operational). The absence of explicit criteria with which to assess significance presented some difficulties in these circumstances, as it was diffi- cult to see how these different effects had been balanced. The SEA also appeared to adopt an implicit assumption that the proposed measures or interventions would prove to be effective, for example in changing travel behaviour in the desired direction. There was no explicit consid- eration of the deliverability or risk associated with proposed measures.
The assessment of the alternative strategies concluded that, overall, the realistic scenario provided the best balance between adverse and beneficial effects (Table 9.5). This conclusion was not clearly explained in the environmental report, although it appeared to reflect the absence of beneficial effects with the do-minimum scenario and the larger number of more severe (i.e. large rather than moderate) adverse effects with the optimistic scenario. Overall, predicted effects against the SEA objectives were as follows:

- Do-minimum scenario: no significant bene- ficial effects; significant adverse effects against 3 SEA objectives (all moderate adverse).
- Realistic scenario: significant beneficial effects 9.9.7
Effects of the plan and mitigation

against two SEA objectives (both moderate beneficial); significant adverse effects against five SEA objectives (all moderate adverse).
against six SEA objectives (three moderate adverse and three large adverse).

The absence of explicit methods or criteria with which to sum or weigh these effects was a weakness in the SEA. For example, it was unclear whether all of the SEA objectives were regarded as of equal importance or weight in the overall assessment.

Following the appraisal of strategic alternatives, the preferred option for the LTP was developed further by the plan team. The resulting strategy in the draft plan was based largely on the realistic scenario and included 45 separate policies. In order to simplify the assessment, the SEA grouped related policies into a smaller number of 'policy components'.

Policies within these components were expected to have broadly similar effects. Six main policy components were identified in the draft plan, including those concerned with (1) improving safety; (2) maintaining and managing infrastruc- ture; (3) promoting sustainable transport modes;
(4)
parking; (5) freight; and (6) major schemes. The effects of these policy components were assessed against each of the SEA objectives, in a similar way as for the assessment of strategic alternatives using the same seven-point qualitative scale.

Significant adverse effects were identified against three of the SEA objectives (to ensure resilience to the effects of climate change and flood risk; to ensure efficient use of land and maintain the resource of productive soil; and to reduce noise, vibration and light pollution). These adverse effects were associated with the draft plan's policies on parking, freight and major schemes. Based on the results of the assessment, recommendations to improve the overall sustainability performance of the plan were made in the environmental report. These included:

- Policies relating to major schemes should include a requirement for a Construction Environmental Management Plan (CEMP) and a Site Waste Management Plan for any scheme that requires construction.

- Optimistic scenario: significant beneficial •

effects against four SEA objectives (all mod- erate beneficial); significant adverse effects There was no consideration of climate change adaptation within any of the policies in the draft plan. Policies relating to major schemes
Table 9 .5 Assessment summary of strategic alternatives for Tyne and Wear LTP

..

SEA Objective	Strategic Alternative 1 The 'Do Minimum' Scenario	Strategic Alternative 2 The Realistic Scenario	Strategic Alternative 3 The Optimistic Scenario
Environmental Objectives			
1	-	0	++
2	-	-	-

3
-
-
-

4
-
0
+

5
-
-
-

6

-
-

7

0
-

8
0
-

9

-

10
-
++

Social Objectives, Including Health and Inequality Issues

11
0
+
++

12
0
0
-

13
-
++
+

14

+
++

15
0
+
+

16
0

+
+

Scale of Effect (SE)
+++ Large beneficial ++ Moderate beneficial + Slight beneficial 0 Neutral or no effects
- Large adverse - Moderate adverse · Slight adverse
Those effects which are either moderate or major are deemed to be significant

No.	SEAObjective
1	Ensure good local air quality for all
2	To protect and where possible enhance biodiversity, geodiversity and the multi-functional green infrastructure network
3	Protect and where possible enhance the European sites (HRA specific objective)
4	To mitigate against climate change by decarbonizing transport
5	To ensure resilience to the ettects of climate change and flood risk
6	Promote prudent use of natural resources, waste minimization and movement up the waste hierarchy
7	Protect and enhance the quality of the area's ground, river and sea waters
8	To ensure efficient use of land and maintain the resource of productive soil
9	Maintain and enhance the quality and distinctiveness of the area's historic and cultural heritage
10	Protect and enhance the character and quality of landscape and townscape
11	To improve accessibility to services, facilities and amenities for all and avoid community severance
12	Reduce noise, vibration and light pollution
13	Improve health and well-being and reduce inequalities in health (HIA specific objective)
14	To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society (Eq/A specific objective)
15	Improve road safety
16	Reduce crime and fear of crime and promote community safety

Source: Tyne and Wear Joint Transport Working Group 2011a

and maintaining infrastructure should be updated to include reference to climate change adaptation.

- Policies on identifying suitable sites for off-road lorry parking provision and freight consolid- ation centres should include reference that the site would not be located in a sensitive loca- tion for biodiversity/geodiversity and would minimize land take and loss of productive land.
- Policies on parking should include a refer- ence to the fear of crime that may occur in car parks, particularly out of town car parks; suitable lighting and security presence may be appropriate forms of mitigation.
- Policies on parking should also make refer- ence to the consideration of noise and light pollution that may be introduced at out of town car parks.

9.9.8 Summary

9.10 Summary

Most of these suggested amendments to the draft plan were incorporated into the policies in the final plan. As a result of these amendments, the performance of the final plan against the SEA objectives was improved, with fewer significant adverse effects identified than for the draft plan. Significant adverse effects were identified only for the major schemes policy component of the final plan, against two of the SEA objectives (resilience to climate change and flood risk and the efficient use of productive land). Further mitigation measures were recommended in the final environ- mental report in order to minimize these effects; these emphasized the need to avoid the location of major schemes in flood risk areas and to minimize the loss of agricultural land in the design of such schemes. A number of generic mitigation measures were also recommended (e.g. environ- mental management best practice measures to be adopted during construction projects).

This case study has examined the application of SEA to local transport plans. UK government guidance indicates that LTPs should be subject to HIA and EqlA, in addition to the requirement for SEA. LTPs also require screening for potential impacts on European protected habitats (habitats regulation assessment). In the case of the Tyne and Wear local transport plan, an attempt was made to integrate these different types of assessment within the SEA. This was achieved by incorporating health, equalities and habitats issues in the scoping and baseline stages of the SEA, and by the inclusion of specific objectives on these issues in the SEA assessment framework. Despite this innovative approach, the case study also reveals some weak- nesses in the SEA process, particularly in relation to the identification and assessment of alternative options and in the evaluation of significance. The use of more explicit criteria with which to assess the significance of predicted effects and to compare alternatives would have helped to improve the clarity of the assessment.

This chapter has examined a number of case studies of EIA in practice. Most of the cases involve EIA at individual project level, although examples of SEA have also been discussed. Links with other related types of assessment, such as health impact assessment and appropriate assessment under the Habitats Directive, have also been explored. While it is not claimed that the selected case studies represent examples of best EIA practice, they do include examples of some novel and innovative approaches towards particular issues in EIA, such as extended methods of public participation and the treatment of cumulative effects. But the case studies have also drawn attention to some of the practical difficulties encountered in EIA, and to some of the limitations of the process in practice. Chapters 11 and 12 provide further discussion of a number of the new approaches considered in the case studies.

SOME QUESTIONS

The followi11g questions are intended to help the reader focus 011 the key issues raised by the EIA and SEA case studies in this chapter.

1. The assessment of incremental and cumulative effects is revealed to be a weak area in a number of the case studies (Section 9.2 and 9.6). Why is assessment of these impacts often problematic in project-level EIA, and what solutions might you suggest to remedy the problem?

2. What factors accounted for the more successful treatment of cumulative effects in the Humber Estuary case study in Section 9.5?

3. For projects affecting European priority habitats, summarize the tests that must be carried out as part of the 'appropriate assessment' process (as discussed in Section 9.3). What guidance is available on the interpretation of these tests?

4. What were the main strengths and weaknesses of the public participation approaches adopted in the Portsmouth incinerator case study (Section 9.4)? How could the effectiveness of the public participation process have been improved?

S Summarize the key similarities and differences between the HIA and EIA processes, as revealed by the Stansted airport case study (Section 9.6). In what ways are the two processes linked?

6
Summarize the main weaknesses in the SEA for UK offshore wind energy, as revealed in the stakeholder consultation (Section 9.7). How might these stakeholder concerns have been more effectively addressed?

7
Comment on the approach used to assess and compare alternatives in the SEA of the Tyne and Wear Local Transport Plan (Section 9.8). How could this element of the SEA have been improved?

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10

Comparative practice 10.1

Introduction

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Most countries in the world have EIA regulations and have had projects subject to EIA. However the regulations vary widely, as do the details of how they are implemented in practice. rhis is due to a • range of political, economic and social factors.

Environmental impact assessment is also evolving rapidly worldwide. When the second edition of this book was being written in 1999, for instance, many African countries and countries • in transition had only recently enacted EIA regulations; by now, some of these countries have had considerable experience with EIA, and are developing more detailed guidelines and regula- tions. Just since the last edition of 2005, the EIA systems of three of the seven countries discussed • in that edition - Peru, Poland and Canada - have undergone major changes, and half of the inter- national organizations discussed at Section 10.9 have updated their EIA guidance.

This chapter aims to illustrate the range of existing EIA systems and act as comparisons with • the UK and EC systems discussed earlier. It starts with an overview of EIA practice in the various continents of the world, and some of the factors that influence the development of EIA worldwide.

It then discusses the EIA systems of countries in • six different continents, focusing in each case on specific aspects of the system:

Benin has one of the most advanced EIA systems in Africa, with good transparency, considerable public participation, integration of environmental concerns with national planning and robust administrative and institutional tools.

Peru's EIA system is typical of many South American countries in its sector-specific orientation, relative lack of public participa- tion and transparency, and late timing in project planning.

Poland resembles several other countries in transition in that its EIA system has changed dramatically since the early post-communist days. In 2000, Poland enacted radical new regulations, which brings its EIA system in line with EU requirements.

China's EIA system is discussed because of the worldwide effect that any Chinese environ- mental policy is likely to have in the future. China's environmental policies are restricted by the need to harmonize them with plans for economic development.

Canada is known for its progressive environ- mental policies. Its federal EIA system has good procedures for mediation and public participation. Significant changes are currently being made to this system.

Australia's EIA system, like Canada's, is split between the federal and state governments. The state of Western Australia provides a

particularly interesting example of a good state system with many innovative features.

The chapter concludes with a discussion of the role of international institutions in developing and spreading good EIA practice for the projects and programmes they fund and support.

Table 10.1 and Figure 2.2 show, to the authors' best knowledge, the status of EIA regulations worldwide in mid-201 I. Box 10.1 gives an initial list of sources of information about EIA worldwide. More than 140 countries have some form of EIA regulation.

1 lowever, EIA practice is not even across different countries worldwide. Figure 10.1 summarizes the evolution of EIA in a typical country: it begins with an initial limited number of EIAs carried out on an ad hoc basis in response to public concerns, donor requirements or industries based in a country with ETA requirements carrying out E!As of their activities in the country without EIA require- ments. Over time, the country institutes EIA guide- lines or regulations. These may prompt a rapid surge in the number of EIAs carried out in that country, as was the case in most EU countries. How- ever, the regulations may apply to only a limited number of projects, or may be widely ignored, leading to only a small increase. Over time, the regu- lations may be fine-tuned or added to, the number of EIAs carried out annually

levels off or may even shrink, and the EIA system is effectively 'mature'. The current status of EIA in different countries can be roughly charted on this continuum. Figure 10.2 broadly shows this status by continent, though individual countries may vary from this.

The situation in Africa is changing rapidly, with many countries having recently instituted EIA-specific regulations to complement earlier framework regulations. This development has been brought about by a range of initiatives including the 1995 African Ministerial Conference on Envir- onment that committed African environment ministers to formalize the use of EIA; and the establishment of several organizations that aimed to improve EIA capacity and collaboration between African countries (e.g. Capacity Development and Linkages for Environmental Impact Assessment in Africa, Partnership for Environmental Assessment in Africa, and several African branches of the International Association for Impact Assessment). On the other hand, EIA in Africa is still beset by a lack of trained personnel, cost, concern that EIA

Box 10.1 Some references of EIA systems worldwide

Table 10.1 Existing EIA systems worldwide {with date of original implementation)

Country	Implementation	Country	Implementation	Country	Implementation
Western Europe		Africa and Middle East		Americas	
Austria	1993,2000	Algeria	1983, 1990	Argentina	1994-6
Belgium	1985-92	Angola	2004	Belize	1995
Denmark	1989, 1999	Bahrain	?	Bolivia	1995
Finland	1994, 2004	Benin	2001	Brazil	1986, 1997
France	1976	Botswana	2005	Canada	1992

Germany
1990,2005---06
Burkina Faso 1997
Chile
1997

Greece
1986,2002
Cameroon 2005
Colombia
1997-2005

Iceland
2000,2005
Comoros 1994
Costa Rica
1998 (partial)

Ireland
1989-2000
Cote d'Ivoire 1996
Cuba
1999

Italy
1986-96
Dem. Rep. of Congo 2002 (partial)
Dominican Rep.
2002

Luxembourg
1994
Egypt 1995
Ecuador
1999

Netherlands
1987,2002
Ethiopia 2002
El Salvador
1998

Norway
1990
Gabon 1979
Guatemala
2003

Portugal
1987
Gambia 2005?
Guyana
1996

Spain
1986,2008
Ghana 1999
Honduras
1993

Sweden
1987-91
Guinea 1987
Mexico
1988

Switzerland
1985
Iran 1994-2005
Nicaragua
1994

United Kingdom
1988
Iraq 1997 (partial)
Panama
2000

Central and Eastern Euroce
Israel
1982,2003
Paraguay
1994

Jordan
1995
Peru
2009

Kenya
2002---03
Uruguay
1994

Kuwait
1990,1995---6
USA
1969

Lebanon
in development
Venezuela
1976

Lesotho 2003
Albania
2004

Armenia
1995

Azerbaijan
1996

Belarus
1992

Bosnia and Herzeg.
2003

Bulgaria
2002,2009

Croatia

2006

Czech Rep.
1991,2001

Estonia
1993,2005

Georgia
2002

Hungary
2005

Kazakhstan
1997

Kosovo
2009

Kyrgyzstan
1997

Latvia
2004

Lithuania
1996-2005

Macedonia
2005

Moldova
1996

Montenegro
2005

Poland
1990-2008

Romania
1995

Russian Fed.
2000 (partial)

Serbia
2004

Slovakia
1994

Slovenia
1996

Tajikistan
2006

Turkey
1983, 1997

Turkmenistan
2001

Ukraine

1995

Uzbekistan
2000

Liberia 2003
Madagascar
1997,2004
Afghanistan
2007

Malawi
1997 (guidance)
Bangladesh
1995

Mali
2008
Bhutan
2000

Mauritania
2004 (partial)
Cambodia
19 99 (partial)

Mauritius
2002
China
2002

Morocco
2003
Hong Kong
1998

Mozambique
1998
India
1994

Namibia
2011
Indonesia
1999

Niger
1998
Japan
1997

Nigeria
1992
Korea
1977-2000

Oman
1982,2001
Lao PDR
2000

Palestinian Auth.
2000

Malaysia
1987

Rwanda
2005
Mongolia
1998

Oatar Senegal
2002
2001
Nepal
Pakistan
1997
1997,2000

Seychelles
1994
Papua New Guinea
1978 (partial)

Sierra Leone
2008
Philippines
2003

South Africa
1997
Sri Lanka
1988

Swaziland
2002
Taiwan
1994-2003

Syria
2002,2008
Thailand
1992

Tanzania
2004---05
Vietnam
1994

Asia

Australia et al.

Togo
1988

Tunisia
1988,1991

Uganda
1998

United Arab Em,
1993,2009

Yemen
1995

Zambia
1997

Zimbabwe
1997 (partial)

Antarctica 1991
Australia 1999
New Zealand 1991

Note: This list represents, to the best of our know1edge, the current status of original EIA legislation worldwide, but we cannot confirm s accuracy. Many EIA regulations have been updated or fine-tuned since the last ed ion of this book, and in other cases speci c EIA regulations have supplemented more general framework regulations. This accounts ror many of the changes in lhis list since 2005.

Sources: Sadr 2009; CISDL 2009; Economic Commission for Africa 2005; World Bank 2006; and many other Internet sites and journal articles.

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EIAtJ III

Early EIAs, often donor funded

EIA regulations/ guidance enacted, increasing EIAs, quality variable
EIA mainstream, fine- tuning of regulations/ guidance

Figure 10.2

Current status of EIA systems worldwide

Early EIAs, often donor funded

EIA regulations/ guidance enacted, increasing EIAs, quality variable

EIA mainstream, line- tuning of regulations/ guidance

might hold back economic development and lack of political will (e.g. Appiah-Opoku 2005; Kakonge 1999). Even where EIA legislation exists, this does not mean that it is put into practice, is carried out well, involves the public or is enforced (Okaru and Barannik 1996). As such, while some African coun- tries such as Benin, the Seychelles and Tunisia have good regulations and considerable EIA prac- tice, others such as Burundi and Guinea-Bissau remain on the far left of Figure 10.2.

Almost all countries in South and Central America have some form of legal system for environmental protection, including at least aspects of EIA. These systems vary widely, reflecting the countries' diverse political and economic systems: average income in some South American countries is more than ten times that in others. In general, the development of EIA in South America has been hampered by political instability, inefficient bureaucracy, economic stagnation and external debt (Brito and Verocai 1999). This may be chang- ing recently - our example of Peru is an example of this - but EIA in South America is often still carried out centrally, with little or no public participation, and often after a project has already been authorized (Glasson and Salvador 2000).

Environmental impact assessment in Asia also varies widely, from very limited legislation (e.g. Cambodia) through to extensive experience with robust EIA regulation set within the context of SEA (e.g. Hong Kong). EIA regulations were estab- lished in many Asian countries in the late 1980s, and EIA is practised in all countries of the region through the requirements of donor institutions. On the other hand, Briffett (1999) suggests that many Asian E!As are of poor quality, with poor scoping and impact prediction, and limited public participation. This is due in part to the perception that EIA may retard economic growth - symbolized by the wish, in some countries, to expose large buildings and infrastructure projects to show off the country's wealth (Briffett 1999). Many coun- tries, like our case study of China, are in the process of revising their early EIA systems in an attempt to deal with these problems.

Since the late 1980s, the Central and Eastem European countries ('countries in transition') have been going through the enormous change from centrally planned to market systems. This has included, in many cases, a move from publicly to privately owned enterprises. Many of these countries' economies were based on heavy indus- try, with concomitant high use of energy and resources, and many went through an economic crisis in the 1990s. Of the countries in transition, the Central and Eastern European countries have achieved (e.g. Poland) or are aiming towards (e.g. Turkey) EU accession, and are harmonizing their EIA legislation with the European EIA Direc- tives. The Newly Independent States of the former Soviet Union all had similar systems, based on the 'state ecological expertise/review system' developed under the former

Soviet Union. The countries of southeast Europe - Albania, Bosnia Herzegovina, Croatia, Yugoslavia and Macedonia - had relatively undeveloped EIA systems. The move from these

- In countries in or near tropical areas, environmental models, data requirements and standards from temperate regions may not apply.
- Socio-cultural conditions, traditions, hierarchies and social networks may be very different.
- The technologies used may be of a different scale, vintage and standard of maintenance, bringing greater risks of accidents and higher waste coefficients.
- Perceptions of the significance of various impacts may differ significantly.
- The institutional structures within which EIA is carried out may be weak and disjointed, and there may be problems of understaffing, insufficient training and know-how, low status and a poor co-ordination between agencies.
- EIA may take place late in the planning process and may thus have limited influence on project planning, or it may be used to justify a project.
- Development and aid agencies may finance many projects, and their EIA requirements may exert considerable influence.
- EIA reports may be confidential, and few people may be aware of their existence.
- Public participation may be weak, perhaps as a result of the government's (past) authoritarian character, and the public's role in EIA may be poorly defined.
- Decision-making may be even less open and transparent, and the involvement of funding agencies may make it quite complex.
- EIAs may be poorly integrated with the development plan.
- Implementation and regulatory compliance may be poor, and environmental monitoring limited or non-existent.

Box 10.2 Factors affecting the implementation of EIA in developing countries

systems to one aligned with the EIA Directives accounts for many of the recent EIA regulations in that region.

Box 10.2 summarizes some of the factors that affect the application of EIA in developing

countries.
The EIA systems of We.stem European countries have already been amended at least twice, accounting for a multiplicity of EIA regulations in each Member State: Directive 85/337 was amended by Directives 97/11 and 2003/35/EC, and some countries already had EIA systems in place before the original Directive of 1985. A recent review of the status of EIA in EU Member States (GH K 20 I 0) showed that E!As are being carried out in all 27 European Member States, including the 12 'new' Member States, with a total of about 16,000 E!As being carried out each year by the EU-27; and there has been a general increase in the number of E!As carried out each year. However, even after three rounds of harmonization, EIA practice still varies widely across Europe.
Environmental impact assessment procedures in North America, Amtralia and New ZealClnd are still among the strongest in the world, with good provisions for public participation, consideration of alternatives and consideration of cumulative impacts. Several have separate procedures for federal and state/provincial projects. However, several of these systems are in the process of being streamlined - some would say weakened - in response to the economic recession and perceived problems of over-complexity and ponderousness.
The following sections discuss the EIA systems of different countries worldwide as examples of the concepts discussed above.
system since 1995, and was identified as one of three francophone African countries that is most advanced in EIA terms (d'Almeida 2001). Its EIA system is characterized by transparency, public participation, integration of environmental con- cerns with national planning and robust adminis- trative and institutional tools (Baglo 2003).
Like many other African countries, Benin's early E!As were carried out at the behest of fund- ing institutions such as the World Bank and Afri- can Development Bank. Benin's constitution of December 1990 placed particular emphasis on environmental protection, and in 1993 the Envir- onmental Action Plan was adopted. In 1995 the Benin Environmental Agency was created and made responsible for, inter alia, implementing national environmental policy, conducting and evaluating impact studies, preparing State of the Environment reports and monitoring compliance with environmental regulations. Although the Agency reports to the Ministry of the Environment, Habitat and Town Planning, it has corporate status and financial independence. The Agency subse- quently developed regulations on EIA in 2001, as well as a range of EIA guides (e.g. on projects that require EIA, EIA for gas pipelines and irrigation projects; Baglo 2003). Benin also has a national association of EIA professionals.
Benin's EIA process is led by the Benin Environ- mental Agency. Although this has only two officers responsible for EIA, it can also draw on a forum of experts from public and private institutions to prepare or review specific EIAs. This approach allows the Agency to operate with minimal staff, ensures ongoing cooperation with other institu- tions and puts into practice the principle of broad participation in decision-making (Baglo 2003).
Figure 10.3 summarizes Benin's EIA process, which consists of:
Benin, in West Africa, was once covered by dense tropical rainforest behind a coastal strip. This has • largely been cleared and replaced by palm trees.
Grasslands predominate in the drier north. Benin's • main exports are cotton, crude oil, palm products and cocoa. Even compared to other nearby coun- tries, Benin has a relatively low GDP per capita. •
However, it has had a fully functioning ElA

screening: this work is decentralized, with responsibility allocated to the ministries responsible for the proposed project's sector; project registration, scoping, and development of terms of reference for the EIA;
systems to one aligned with the EIA Directives
accounts for many of the
through the creation of ad hoc Public Hearing Commissions;

- review of the EIS by the Agency: where the EIS is adequate, the Agency issues a certificate of environmental conformity;

- decision about the project by the ministry responsible for the sector concerned, taking into account the notice of environmental compliance, technical feasibility study and economic feasibility study; and

- follow-up assessment and audit.

10.4
 Peru

Between 1997 and 2002, 78 EIAs were reviewed and 61 EISs were validated with certificates of env- ironmental conformity (Yaha 2007). Projects that have been subject to EIA in Benin include live- stock development projects, road improvements,
drainage improvement in Cotonou following the 2010 floods, expansion of the Ouesse landfill site, urban and industrial development projects, and the West African Gas Pipeline. These have been paid for through a mixture of donor (e.g. World Bank), private and national government funds.

Environmental impact assessment practice in Benin, as in many other African countries, is limited by poor collaboration between some key ministries, a low level of public environmental awareness, illiteracy and poverty. Early problems with lack of indigenous expertise have been reduced through a range of EIA training courses run by the Benin Environmental Agency, the activities of its national association of EIA pro- fessionals and its participation in pan-African capacity-building activities (see Section 10.2).

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Figure 10.3

Benin's EIA procedures

Source: Based on Sutherland ct al. 2005

Peru, the third largest country in South America, includes a thin dry strip of land along the coast, the fertile sierra of the Andean foothills and uplands, and the Amazon basin. Fishing, agricul- ture and mining are the main industries. A change in government in 1990 led to the reconstruction of the country after years of economic difficulties, and an extensive privatization programme - including the privatization of many of the state- owned mines - encouraged dramatic increases in foreign investment.

In September 1990, the Peruvian government enacted Decree 613-90, the Code of Environment and Natural Resources. J'his established EIA as a mandatory requirement for any major develop- ment project, but did not specify the EIA contents or legal procedures. The Ministry of Energy and Mining was the first ministry to put this decree into practice through Supreme Decree O16-93-EM, followed in 1994 and 1995 by separate but similar requirements by the ministries for fishing, agricul- ture, transport and communication, housing and building. Early indications were that EIS quality was quite high, but the discussions of mitigation measures were weak (Iglesias 1996), and public participation was limited.

Law 27,446 of 2001 - reaffirmed in October 2009 through Supreme Decree 019-2009-MINAM - replaced this disparate system of EIA with a unified national system that also applies to policies, plans and programmes. The remainder of this section focuses on this new system.

Annex II of Supreme Decree 019-2009-MINAM lists a wide range of projects and plans that require assessment, under headings that represent the relevant competent authority (e.g. agriculture ministry, energy and mining ministry). Any developer whose project is listed in Annex II, including modifications to pre-existing projects if these will have significant impacts, must prepare a preliminary evaluation. This includes details about the project, a plan for citizen participation, a brief description of the project's possible environmental impacts and mitigation measures. The competent authority must decide within 30 days whether the project is Category 1 (minor environmental impacts), II (moderate impacts), or Ill (significant impacts). An annex in the Supreme Decree lists the criteria that competent authorities must use in making this judgement: they include factors relating to human health, natural resources, designated areas, biodiversity and its components, and people's lifestyles. If the project is Category I, then the preliminary evaluation becomes a 'declaration of environ- mental impact' and no further action is required. If, instead, the project is Category II or III, it requires, respectively, a semi-detailed or detailed EIS. The Supreme Decree details what information these EISs must contain, including an executive summary, project description, baseline data, information on how the public and statutory consultees were involved and any comments made at public meetings, impact assessment including comparison with environmental standards, and environmental management, contingency and closure plans. Only organizations on a register of institutions managed by the national environ- mental agency are allowed to prepare EISs. All EISs are public documents. The Supreme Decree supports public involvement in the EIA process but does not mandate specific techniques for this.

Once the EIS has been prepared, the developer submits it to the competent authority, who then has 40 (Category II) or 70 (Category III) days in which to review it and, if appropriate, consult the public on it. If necessary, the developer then has a limited time to comment on the review and provide further evidence, with a further 20 day resolution process. rhe EIA review process should take no longer than 30 days in total for Category I, 90 days for Category II and 120 days for Category III projects. At the end of the process, the competent authority can either provide or refuse to provide a certificate of EIS. Developers may only apply for other licenses or permits, and may only start project construction if they have received a certificate of EIS. The certificate also sets out specific obligations to prevent or mitigate potential environmental impacts.

Once a project is approved, the developer must carry out programmes of management, control and monitoring throughout the operations to ensure that the environmental management plan is adhered to. The environmental management plan, contingency plan, community relations plan, and/or decommissioning plan (as appropriate) must be updated five years after the project be- comes operational, to ensure that they remain relevant and up to date.

Strengths of this new system include:

- The certificate system, which aims to deal with past problems of EISs in Peru being frequently prepared after the project construction has begun (Brito and Verocai 1999).
- The detailed requiremens for Category II and III EISs, which should help to ensure that the EISs are of good quality and provide the information necessary for the competent authorities to make informed decisions.
- The clearly stated and relatively limited time period for EIS review, which should prevent EISs from slowing down needed development.
- The emphasis on impact management, contingency planning and monitoring, which should help to ensure that project impacts are effectively managed.
-

Weaknesses include the fact that the compe- tent authorities charged with promoting certain types of development are also those that provide EIS certificates for those develop- ments, leading to a potential 'poacher-game- keeper' situation; and the lack of clear, forceful requirements for public participation in the EIA process. 10.5

China

Since 1978, China has been undergoing a rapid shift towards economic growth, decentralization of power, industrialization, private enterprise and urbanization. This has engendered many development projects with significant environ- mental impacts. China's EIA system has struggled to keep up, and to date has not managed to prevent some serious environmental harm (Moorman and Ge 2007). rhe system is still in a process of rapid evolution, with the strengthening in 2009 of its applications to plans and programmes.

EIA in China formally began with the enact- ment of the Provisional Environmental Protection Law of 1979, which was revised and finalized in 1989. Shortly after the law's introduction, several guidelines for its implementation were prepared, of which the central ones were the Management Rules on Environmental Protection of Capital Construction Projects of 1981. These were revised and formalized in 1986, with details on timing, funding, preparation, review and approval of EISs. Further, stronger ordinances were enacted in 1990 and December 1998, which required EIA for regional development programmes as well as individual projects, and strengthened legal liabilities and punishment for violation of EIA requirements.

At this stage, EIA still acted

> very much as a top-down administrative instrument, in response to serious environ- mental deterioration and external pressure from international funding organizations ... IT]here was no preconceived notion that the public should be involved in the EIA process. (Wang et al. 2003)

Although tens of thousands of EISs or environ- mental impact forms were being prepared in China every year (Ortolano 1996), many projects that should have been subject to EIA were not, many EIAs were carried out post-construction, and the quality of EISs was variable (Mao and Hills 2002; China 1999).

Major changes to this system were brought about by the enactment of the EIA Law in October 2002. Table 10.2 lists existing EIA legislation and guidelines in China, and Figure 10.4 summarizes these new EIA procedures.

The competent authority for projects of national economic or strategic significance is the Ministry of Environmental Protection (MOEP, formerly the State Environmental Protection Agency). These projects are listed in MOEP Decree 5 and guidance of 2009, and include nuclear projects and projects crossing provincial boundaries. For projects of regional importance such as waste incinerators, smelters and chemical plants the competent authority is the provincial Environmental Protec- tion Bureau (EPBJ; and for other types of project the provincial EPBs can determine whether the competent authority is the provincial, city or county/district EPBs. Usually district or county EPBs only examine EIA forms.

The EIA process begins when a developer asks the competent authority to determine whether or

Table 10.2 Chinese EIA regulations, governmental documents and guidelines

Name	Year
Regula1ions on Environmental Management of Construction Projects (Staie Council Decree 253)	
Circular on Relevant Issues of Executing EIA for Construction ProJecis (107 SEPA 1999)	
Forms for Environmental Impact Form and Environmental Impact Registrabon Form (draft) {178 SEPA 1999)	
Acceptance of Construction Project Environmental Protection Management Regulation (SEPA Decree 13)	
Law of the People's Republic of China on EIA (Presidential Decree 77)	
Provisions on Examination and Approval Procedure for EIA Documents of Construction Projects by the SEPA (SEPA Decree 29)	
Circular of Printing and Distributing 'Provisional Regulation for Public Participation in EIA'	

(28 SEPA 2006) Classified Directory for EIA of Construction Projects (MOEP Decree 2)
Announcement on the Catalogue of Construction Projects with EIA Documents Directly Examined and Approved by the MOEP and Catalogue of Construction Projects with EIA Documents Examined and Approved by Provincial Environmental Bureaus as Enstrusted by the MOEP (MOEP Announcement 7)
Prov,sion of Approval of EIA for Construction Projects by Categories (MOEP Decree 5)
1998
1999
1999
2001

2002

2005

2006

2008

2009

2009

Source: Yang, personal communication

not a proposed action requires full EIA. As in Peru, • three different levels of EIA apply in China. Projects with major potential environmental impacts • require a full EIS, those with more limited impacts • require an environmental impact form, and those
the short-term and long-term environmental impacts of the project;
impact significance and acceptability;
a cost-benefit analysis of the environmental impacts;
with minimal impacts require only an environ- mental impact registration form with no further data provision. MOEP Decree 2 specifies what kind of EIA is needed for different projects, based on the project's impacts and the sensitivity of the receiving environment.
The competent authority personnel, sometimes assisted by outside experts, conduct a preliminary study and then makes a ruling. If an EIA is needed, the competent authority identifies those factors most likely to affect the environment and prepares a brief. The ElS's preparation is then entrusted to licensed, state-approved experts, who work to the brief. The expert analyses the relevant impacts and proposes mitigation measures. An EIS is then produced, which, according to the guidelines, needs to discuss:

- the general legislative background;
- the proposed project, including materials consumed and produced;
- the baseline environmental conditions and the surrounding area;
- proposals for monitoring; and
- conclusions.

The public is to be given an opportunity to comment prior to the completion of a draft EIS, although the form of public participation is not prescribed. The organization that prepares the

EIS must formally consider the opinions of relevant stakeholders, experts and the public, and include in the EIS their reasons for accepting or rejecting these opinions.
The EIS or environmental impact form is submitted to the competent authority, which checks the proposal against relevant environmental protection regulations and plans, confirms whether the area has the carrying capacity to cope with the project, considers whether the proposed mitigation measures are likely to be effective, and takes into account the comments of relevant experts before making a decision. For a controversial project, and projects that cross provincial boundaries, the document is submitted to the higher authority for examination and approval. If the project is

Figure 10.4

China's EIA procedures
Source: Based on Wang et al. (2003)

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approved, conditions for environmental protection may be included, such as monitoring and verifica- tion procedures. The competent authority must submit a report that states how the project will be carried out and how any required environmental protection measures will be implemented. Once this has been approved by the provincial authori- ties, a certificate of approval is issued.
The changes post-2002 certainly aimed to redress many of the problems of China's earlier EIA system. Developers are not permitted to begin construction until they have carried out EIA.The MOEP has used the law as the basis for carrying out several 'environmental storms' that have stopped projects whose construction had started before their EIA reports were approved. MOEP also announced in 2007 that no new projects would be
approved in several cities with low environmental capacity to handle more pollutants (Yang 2008).
However, there is still often a conflict of interest between development-oriented local governments and the environmental protection agencies that they fund, and between people's priorities for environmental growth for improvement of their living standards. As such, local authorities are often unwilling to antagonize local leaders who strongly favour the proposed project, or impose constraints in the form of EIA (Mao and Hills 2002; Lindhjem et al. 2007). China's EIA process also continues to be criticized for its complexity, narrow historic focus on air, water and soil pollution, relatively low requirements for public participation, and lack of consideration of alternatives (Lindhjem et al. 2007; Wang et al. 2003; Yang 2008).

Poland, like other countries in transition, has undergone a rapid evolution in environmental policy, which is reflected in its EIA legislation and system.
In the latter days of communism, the com- munist regime was providing only the most basic services and environmental issues were being virtually ignored (Fisher 1992). Several areas of Poland were subject to severe pollution, causing widespread concern. In response to this, the government enacted the Environmental Protection Act (EPA) in 1980. This was subsequently strength- ened through various amendments, the Land Use Planning Act of 1994, and an executive order of 1990 on developments exceptionally harmful to the environment. Under this system, an EIA began when a developer asked a local environmental authority whether an EIA was needed. If it was, the authority drew up a list of suitable consultants to carry out the work. Once the chosen consultant had completed the EIS, consultation with the public might be carried out but was not mandatory. If the EIS was accepted by the environmental authority, then the local planning authority could issue a 'location indication,' which listed altern- ative locations for the project. Based on this, the developer chose a site and continued to design the project, and the environmental consultants prepared a final EIS. The developer delivered the EIS along with a planning application to the local planning authority, which again consulted with the local environmental authority before making a decision about the project. Construction consent required yet a third EIS to accompany the technical design of the project.
This system was criticized for lacking screening criteria, being cumbersome and redundant with multiple EISs prepared for each project, having minimal procedures for public participation and for resource constraints on the commission that reviewed the EISs Oendroska and Sommer 1994). It also could not deal with the huge social and economic changes that Poland went through after the overthrow of the Communist regime in late 1989:
There are no more economic plans and cen- tral planners, the currency is convertible and the best technology accessible, and the whole economy is being privatised. More- over, administrative arrangements have been redesigned in order to create a strong central agency as an environmental watchdog ... [butl old industry is still operating. The ob- served improvement of environmental records since 1989 is only a side effect of the recession
... EIA law in Poland still retlects two char- acteristic features of the Communist regime: an aversion to getting the general public involved in decision-making, and a reluc- tance to developing procedural rules for dispute settlement. This means that this legis- lation not only is not efficient enough from the 'environmental' point of view, but also docs not match the political and economic transformation towards an open and demo- cratic society and a free market. Uendroska and Sommer 1994)

In 1994, Poland became an associate partner of the EU, and it formally joined the EU in 2004. This process has required Poland to incrementally change its laws and statutes to progressively bring them in line with those of the EU. This process began with 1995 and 1998 amendments to the executive orders of 1990, and subsequently con- tinued with three key EIA regulations: the 2000 Act on Access to Information on the Environment and its Protection and on EIA; the 2001 Environ- mental Protection Law (EPL), and the pithily named 2008 Act on Providing Information on the Environment and Environmental Protection, Public Participation in Environmental Protection and on Environmental Impact Assessment, which replaces the EPL.
Changes made over time to Poland's original EIA system include application of EIA to a wider range of projects; new requirements for screening, including two lists of projects requiring EIA that reflect Annexes I and II of the EIA Directive; greater emphasis on scoping; greater requirements for public consultation; requirements for trans- boundary impact assessment; and a concerted attempt to shift the emphasis of EIA from the preparation of a report to the process as a whole (Wiszniewska et al. 2002; Woloszyn 2004).

Poland,

The new system is relatively typical of EIA in the EU, but includes some interesting variants (l'IFIA 2008; EC 2009):

- It integrates the Habitat Directive's require- men ts for appropriate assessment into the EIA process. EIA is required not only for the equivalent to EIA Directive Annex I projects and Annex II projects that are likely to have significant environmental impacts, but also for projects that require appropriate assess- ment under the Habitat Directive. These EIAs must assess the impact of the project on Natura 2000 sites, and discuss alternatives and mitigation measures considered in rela- tion to their impact on Natura 2000 sites.

- For projects that may have sigificant environmental impacts (Annex II equivalent), the developer must prepare an 'environmental information card' as a basis for the EIA screen- ing stage. Where the competent authority decides that EIA is not required, the environ- mental information card serves as the basis for the official 'screening out' statement. Where EIA is required, the card serves as the basis for a mandatory scoping opinion.

- The EIS must include a description of analysed options, including the option favoured by the applicant, a rational alternative option, and the most advantageous option for the environ- ment; and an analysis of probable social conflicts related to the project.
- A Decision on Environmental Conditions is required before any Annex I or II equiva- lent projects can get planning permission. The Decision on Environmental Conditions is based on the EIA or 'environmental informa- tion card', comments on the EIA from statutory consultees, the public, and other countries where relevant, and additional information such as land registry maps.
- If the EIA process shows that the project should be implemented according to a scen- ario other than that favoured by the applicant, the authorities issuing the Decision on Envir- onmental Conditions are expected to specify that this scenario is the one that should be implemented. If the applicant does not agree to this, the authorities are expected to refuse permission for the project.

Depending on the source (EU 2009 or GHK 2010), approximately 2,200 to 4,000 EIAs are carried out in Poland every year. Of these, only a small proportion concern projects with trans- boundary impacts. However, because of the large initial number - GHK (2010) suggests that Poland might account for one third of all of the E!As carried out in the 27 EU Member States - Poland has been involved in a high number of trans- boundary E!As, including roads, railway lines and transmission lines. Poland has bilateral agreements with several other European Member States on applying EIA in a transboundary context, which regulate such issues as the translation of EIA documentation, timeframes, principles and formats of public participation, etc. (EU 2009).

10.7 Canada

Canada is an example of a country with a long- standing and strong EIA system that is currently in a state of flux. Canada's wealth of natural resources, which were originally plundered indis- criminately by the giant 'trusts' in coal, steel, oil and railroads, its lack of strong planning and land- use legislation, and the conflicting needs of its powerful provincial governments all prompted the development of a mechanism by which widespread environmental harm could be prevented. Canada's El/\ system is characterized by a split between national and provincial procedures, quite complex routeing of different types of projects through different types of EIA processes, and innovative approaches to mediation and public participation in EIA.

Responsibility for EIA in Canada is shared between the federal and the provincial govern- ments. The federal procedures apply to projects for which the government of Canada has decision- making authority. Early federal EIA guidelines were progressively strengthened throughout the 1970s and 1980s, and made legally binding in 1989. However concern over the limitations of this 'Environmental Assessment and Review Process' caused it, in turn, to be replaced in 1995 by the Canadian Environmental Assessment Act. Amend- ments to the act were made in 2001 and 2010. SEA of policy has been required since 1993, and SEA requirements were strengthened in 1999.

Gibson (2002) gives a useful review of the develop- ment of Canada's federal EIA system up to 2002. rhe Canadian Environmental Assessment Agency (CEAA) administers the Canadian Environ- mental Assessment Act. An initial self-assessment by the responsible agency proposing the action determines whether the action requires EIA under the Act; that is, whether it:

- is a 'project' as defined by the Act;

- is not excluded by the Act's Exclusion List regulation;
- involves a federal authority; and
- triggers the need for an EIA under the Act. 10.8

Australia and Western Australia 10.8.1

1 EIA in Western Australia

The Exclusion List Regulation identifies projects for which EIAs are not required because their adverse environmental effects are not regarded as significant (e.g. simple renovation projects). Once an EIA is determined to be required, a decision is made as to which of four EIA tracks to follow: screening, comprehensive study, mediation or review panel. Most projects require a 'screening' involving documentation of the project's envir- onmental effects and recommended mitigation measures. 'Class screening' may be used to assess projects with known effects that can easily be mitigated. 'Model class screenings' provide a generic assessment of all projects within a class: the responsible authority uses a model report as a template, accounting for location- and project- specific information. 'Replacement class screenings' apply to projects for which no location - or project- specific information - is needed.

A small number of projects - typically less than one per cent - will require a fuller 'comprehensive study'. These projects are listed in the Compre- hensive Study List Regulations and include, for instance, nuclear power plants, large oil and gas developments and industrial plants.

If a screening requires further review, it is referred to a mediator or review panel. Similarly, early in a comprehensive study, the Minister of the Environment must decide whether the project should continue to be assessed as a comprehen- sive study, or whether it should be referred to a mediator or review panel. Projects are normally referred to a mediator or review panel - essentially changing them from self-assessment by the respon- sible agency to independent, outside assessment -
where the significance of their impacts is uncertain, where the project is likely to cause significant adverse environmental effects and there is uncer- tainty about whether these arc justified, or where public concern warrants it (CEAA 2003). A review panel is a group of experts approved by the Minister of the Environment, which reviews and assesses a project with likely adverse environ- mental impacts. The mediation option, new since 1995, is a voluntary process in which an inde- pendent mediator appointed by the Minister helps the interested parties to resolve their issues through a non-adversarial, collaborative approach to problem-solving. Very few projects go through the review panel or mediation route.

Any project requiring comprehensive study, mediation or a review panel must consider alterna- tive means of carrying out the project, the project's purpose and its effects on the sustainability of renewable resources; and must include a follow- up programme. The responsible authority must take the results of the comprehensive study, or the mediator's or review panel's recommendations into account when making a decision on the project (CEAA 2003). Public comments must be considered at various stages of the EIA process, though it is more restricted for screenings. A participant-fund- ing programme allows stakeholders to participate in comprehensive studies, panel reviews and medi- ation, and Aboriginal people have a specific con- sultation process (Sinclair and Fitzpatrick 2002).

The CEAA publishes many of its reports on the Web. Between 2006 and 2010, more than 22,000 federal EIAs were carried out: 99.6 per cent were screenings, but 97 comprehensive studies and 19 panel reports were also initiated during that time. The comprehensive studies included studies for pipelines, offshore oil and gas projects, mines, waste treatment centres, and decommissioning of a range of former projects (CEAA 2011).

Most of Canada's provinces have quite widely
varying EIA regulations for projects under their own jurisdictions. These include Ontario's EA Act of 1976, very advanced at the time, but subse- quently weakened in 1997; and Manitoba's sus- tainable development code of practice of 2001, which requires public officials to promote consider- ation of sustainability impacts in EIA. In early 1998, federal and provincial

environment ministers signed an accord on EIA harmonization, which promotes cooperative use of existing processes to reduce duplication and inefficiency (Gibson 2002). Concern over the duplication of functions between the federal and provincial levels, unclear leadership of EIAs where several government agencies are involved, and lengthy government processing led to changes to the Canadian Environ- mental Assessment Act in 2010, and to proposed regulations that would restrict the time that comprehensive studies can take. The changes to the act, which are widely perceived as weakening Canada's EIA process (e.g. Green Budget Coalition 2010), include delegation of the authority for EIA of major energy projects from the CEAA to the National Energy Board and Canadian Nuclear Safety Commission, exemption of many infrastruc- ture projects from EIA, greater coordination functions being given to the CEAA, and powers being given to the Minister of the Environment to scope EIAs (with concerns that important impacts, or parts of projects, could be scoped out). A Parliamentary review of the Canadian Environ- mental Assessment Act, begun in autumn 2010, may well lead to further changes.

Like Canada, Australia also has a federal (Common- wealth) system with powerful individual states. Its environmental policies, including those on EIA, have some interesting features but arc generally not as powerful as those of Canada. The Common- wealth EIA system was established as early as 1974 under the Environmental Protection (Impact of Proposals) Act. It applied only to federal activities. During the life of the Act (1974-2000) about 4,000 proposals were referred for consideration, but on average less than 10 formal assessments were carried out each year (Wood 2003). As such, the states put in place their own legislation or pro- cedures to extend the scope of EIA to their own activities, and many of these state systems have become stronger and more effective than the national system.

Over time there has been concern about the variation in EIA procedures, and their implemen- tation, between states in Australia and there have been attempts to increase harmonization (Australian and New Zealand Environment and Conservation Council-ANZECC 1991, 1996, 1997; see also Harvey 1998; Thomas 1998). In addition, a major review of Commonwealth EIA processes was undertaken in 1994, producing a set of very useful reports on cumulative impact and strategic assessment, social impact assessment, public parti- cipation, the public inquiry process, EIA practices in Australia and overseas comparative EIA practice (CEPA 1994). The review highlighted, among other issues, the need to reform EIA at the Common- wealth level - including a better consideration of cumulative impacts, social and health impacts, SEA, public participation and monitoring.

Following government changes and a further review of federal/state roles in environmental protection, Australia repealed its Commonwealth EIA legislation, and several other environmental statutes, to create the Environmental Protection and Biodiversity Conservation Act (EPBCA) in 1999. The EPBCA provides a lot more procedural detail than the original EIA legislation, and a range of documents has been produced to explain the processes (Environment Australia 2000). EIA is undertaken for matters of national environmental significance, defined as World Heritage proper- ties, Ramsar wetlands, threatened and migratory species, the Commonwealth marine environment and nuclear actions. The Act promotes ecologically sustainable development; it also provides for SEA ([EMA 2002).

Padgett and Kriwoken (2001), Scanlon and Dyson (2001), and Marsden and Davers (2002) provide early commentary on the Act and some developments in EIA and SEA in Australia. In its first year, the EPBCA did not appear to increase much the rate of Commonwealth EIA activity (Wood 2003), but by 2009-10 there had been a substantial increase to about 420 referrals in the year. The referrals were concentrated on proposals in the main resource development states of Queens- land and Western Australia, and also Victoria, espe- cially for mining and mineral exploration, and for residential development (Australian Govern- ment Department of Environment 2010). A review was undertaken of the first 10 years of operation of the EPBCA (Australian Government, Depart- ment of Environment 2009). Many positive fea- tures were noted, including: clear specification of matters of national environmental significance, theEnvironment Minister's role as decision-maker, public participation provisions, the explicit con- sideration of socio-economic issues, statutory advisory mechanisms and a strong compliance and enforcement regime. Important recommenda- tions for change included: renaming it as the Australian Environment Act, establishing an inde- pendent Environment Commission to advise the government of project approvals, strategic assess- ments etc, provide for environmental performance audits, set up an Environmental Reparation Fund, and improve transparency in decision-making.

The Western Australia (WA) EIA system provides an interesting example of a good state system that includes many innovative features. Central to the success of the Western Australian system is the role of the EPA (Wood and Bailey 1994). The Environmental Protection Authority (EPA) was established by the WA Parliament as an Authority with the broad objective of protecting the

State's environment and it is the independent environ- mental adviser that recommends to the WA government whether projects are acceptable. It is independent of political direction. The EPA deter- mines the form, content, timing and procedures of assessment and can call for all relevant infor- mation; the advice it provides to the Minister for the Environment must be published. The EPA overrides virtually all other legislation, and the environmental decision (with conditions) is central to the authorization of new proposals. Other permits must await the environmental approval, based on the EIA.

Proposals may be referred to the EPA by any decision-making authority, the proponent, the Minister for the Environment, the EPA or any member of the public. The EPA determines the level of assessment. Until late 2010 there were five levels of assessment, the most comprehensive being the Public Environmental Review (PER) and the Environmental Review and Management Pro- gramme (ERMP). Under new procedures (WA EPA 2010), these have now been reduced to two: Assessment on Proponent Information with no public review, and Public Environmental Review with a public review period of generally 4-12 weeks. In practice this does not significantly alter the EPA EIA procedures as the previous five levels of assessment could broadly be divided into either assessment without public review or assessment requiring a public review. Criteria for deciding the levels of assessment arc set out in Table 10.3 (a).

Guidance is provided on scoping and on the content of the PER, as set out in Table 10.3 (b) and (c). The PER document is produced by the proponent, and it is subject to public review. The guidance on scoping for a PER contains interesting features, especially in relation to peer review and public consultation. The PER assessment pays particular attention to the regional setting, and seeks to highlight potential 'fatal flaws'. Waldeck et al. (2003) found that such EIA guidance influ- enced the practice of consultants and was per- ceived as effective in enhancing the outcomes of the EIA process - including increased certainty of outcome of the EIA process, and better design of proposals to meet environmental objectives from the outset.

The EPA then assesses the environmental acceptability of the proposals on the basis of the review document, public submissions, proponents' response, expert advice and its own investigations. The resulting EPA report to the Minister for the Environment pronounces on the environmental acceptability or otherwise of the proposal and on any recommended conditions to be applied to ministerial approval. Figure 10.S provides an outline of the full procedure for PER assessment. The centrality of the EPA's review of the relevant environmental information to the Minister's decision, which itself has predominance, is the most remarkable aspect of the WA system, and one which highlights the significance of the EIA impact on decisions. The WA system also has a high level of public participation, especially in controversial EIAs. The central role of the EPA also ensures consistency.

However, the limited integration of the EIA and planning procedures and a biophysical focus to assessment have been weaker features of the WA procedures. Amendments in the mid-1990s were designed to secure better integration, improving the EIA of land-use schemes, but they did also reflect a shift of control away from the EPA to the Ministry of Planning. This was symptomatic of challenges faced by an effective system. Interest- ingly though, there is now provision for the EPA

Table 10.3 Some features of the Western Australian EIA system

(a) Criteria for deciding levels of assessment

For a proposal to be assessed at an API level, it must meet all of the following criteria:

- the proposal raises a limited number of significant environmental factors that can be readily managed, and for which there is an established condition-setting framework;
- the proposal is consistent with established environmental policy frameworks, guidelines and standards;
- the proponent can demonstrate that ii has conducted appropriate and effective stakeholder participation; and
- there is limited, or local, interest only in 1he proposal.

If, based on the referral information, the EPA considers that 1he proposal is environmentally unacceptable, the chairman of the EPA will encourage 1he proponent to wi1hdraw the referral or submit a new significantly modified proposal. The criteria for determining whether a proposal is unacceptable are set out in the Category 'B' of the accompanying Administrative Procedures (e.g. inconsistent with environmental poicy framework, likely to have significant impacts, proposal cannot be easily modified etc).

If a proposal meets any of the following criteria the EPA will apply a PER level of assessment:

- the proposal is of regional or WA state-wide significance;
- the proposal has several significant environmental issues or factors, some of which are considered to be complex or of a strategic nature;
- substantial and detailed assessment of the proposal is required to determine whether, and if so, how the environmental issues could be managed; or
- the level of interest in the proposal warrants a public review panel.

(b) A formal Environmental Scoping stage for PER

An Environmental Scoping Document (ESD), designed to direct the proponent on key issues to address, and to identify impact predictions and information on the environmen1al setting, shall include:

- a concise description of the proposal and its environmental setting;
- the identification of the key environment factors and other environmental factors relevant to the proposal;
- the identification of the existing policy context relevant to each factor;
- the preliminary identification of the potential environmental impacts;
- a Scope of Works, setting out the proposed environmental studies and designed to identify or predict the direct and indirect environmental impacts of the proposal, including timeline for completion {the studies and investigations should be clearly linked to the identified environmental impacts and factors);
- the identification of an environmental management programme required;
- the identification of the spatial datasets, information products and databases required;
- a list of people, if necessary, proposed to provide peer review of the scope, methodologies, findings and/or conclusions of the surveys and investigations; and
- stakeholder consultation requirements.

(c) Guidance on the form and content of the assessment document for PER

The proponents should ensure that the PER document focuses on the environmental issues/factors of key significance. The document should include the following:

- a description of the proposal and alternatives considered, including alternative locations, with a view to minimizing environmental impacts;
- a description of the receiving environment, its conservation values and key ecosystem processes, and discussion of their significance in a regional setting - this should focus on those elements of the environment that may affect or be affected by the proposal;
- identification of the key issues (and list the environmental factors associated with these issues) and their potential 'fatal flaws';
- discussion and analysis of the direct and indirect impacts of the proposal, in a local and regional context, including cumulative impacts;
- findings of the surveys and investigations undertaken (and technical reports provided as appendices);
- identification of the measures proposed to mitigate significant adverse impacts;
- identification of any offsets, where appropriate, after all other steps in the mitigation sequence have been exhausted;
- environmental management programme;
- demonstration that the expectations for EIA identified elsewhere in the procedures have been carried out; and
- details of stakeholder and government agency consultation, how comments received have been responded lo, and any subsequent modifications of the proposals.

Source: WA EPA 2010

Proponent EPA

Legend
0 Decision point
C
Option

D
Action 10.9
International bodies

Figure 10.5

Outline of procedure for a PER assessment (Western Australia) Source: Western Australia EPA (2010)

to assess strategic proposals, including policies, plans, programmes and developments. There is also provision for 'derived proposals' identified in assessed strategic proposals (which themselves have been agreed for implementation, and where environmental issues have been adequately addressed); in such cases the derived proposal would not require further assessment by the EPA except for checking on whether any implementa- tion conditions relating to the proposal should change. With regard to socio-economic impacts, in 1993, WA lost its pioneering Social Impact Unit, which had provided expert advice on social impacts, and there is a continuing strong devel- opment lobby, in a state highly dependent on major energy and mineral projects, to further 'soften green laws'. However, for some recent high- profile and major energy and mineral develop- ments in the north of the state, proponents and their consultants have been adopting more inno- vative environmental-social-economic approaches to assessment.

Many of the major international funding institu- tions and other international organizations have established EIA procedures. In several cases these have evolved over time, with some handbooks or guidance manuals now on their second or third edition, or with multiple updates. The E11ropea11 Rank for Reconstruction and Develop- ment's EIA requirements are typical of those of other lending institutions. The bank's environ- mental procedures of 1996 were updated in 2003 and have recently been widened out to environ- mental and social procedures (EBRD 2010). These aim to ensure that the environmental and social implications of potential bank-financed investment and technical co-operation projects are identified and assessed early in the bank's planning and decision-making process, and that environmental and social considerations - including potential benefits - are incorporated into the preparation, approval and implementation of projects.

The EBRD's assessment system is very much integrated into its project development process, as a process of due diligence. Main assessment steps involve:

- collection of preliminary information;
- project categorization to determine the level of EIA needed;
- impact assessment to inform due diligence considerations;
- disclosure of information; and
- characterization of environmental risks and opportunities, and risk management.

This is followed by Board approval, final negoti- ations and signing, implementation and monitor- ing (EBRD 2010).

Preliminary information includes the location of the project, historical and current land uses at the site, proposed construction activities, whether resettlement or economic displacement is likely to occur, characteristics of the local population including vulnerable groups, whether there are significant environmental and/or social issues of concern, who the main project stakeholders are, and the environmental and social reputation of the client. This information is used in screening discussions between the bank and the project sponsor to sort the proposed project into one of several categories:

- Category A: projects likely to cause significant adverse impacts, which, at the time of screen- ing cannot readily be identified or assessed. A full EIA is required for these projects. Some types of projects automatically come under Category A; others are put into Category A on a case-by-case basis.

- Category R: projects likely to have less severe

impacts than Category A projects. These re- quire a less stringent environmental analysis. The scope of the environmental analysis is determined on a case-by-case basis.

- Category C: projects likely to result in minimal or no adverse impacts and that do not need analysis.

- Category Fl: projects that will be developed through a financial intermediary. These re- quire a variant on the EIA process discussed below.

Staff from the EBRD's Environment and Sustainability Department then establish terms of reference for the environmental and social assessment, including stakeholder engagement, and how compliance will be assessed. The client carries out these studies with support of EBRO staff. Measures to manage and mitigate a pro- posed project's impacts arc typically set out in an Environmental and Social Action Plan. Public disclosure and consultation is required throughout the planning and assessment/analysis processes of Categories A and B projects. The EBRD sets environ- mental standards for each project. It may also specify an environmental and social action plan and/or monitoring to be carried out by the sponsor as a condition of investment. Prior to making a final decision about whether to lend money for the project, bank officials review the environmental due diligence information available, ensure that proposed mitigation measures are agreed with the project sponsor, highlight opportunities for environmental improvements, identify environ- mental monitoring requirements and any tech- nical/environmental cooperation initiatives that should be undertaken and advise on whether the project complies with the Bank's environmental policy and procedures.

The Asian Development Bank's Environmental Assessment Guidelines (ADB 2003) have similar screening and assessment requirements. The guidelines give more detailed information about assessment of projects vs. programmes, a range of different sectors, equity investments, etc.; they also stress consultation.

The World Bank perceives Eli\ as one of its key environmental and social safeguard policies. Its Operational Policy/Bank Procedures 4.01 (most recently updated in 2007) require EIA for relevant lending operations, and its Environmental assess- ment sourcebook (World Bank 1991) and various updates explain the EIA process. EIA involves screening of the project into assessment categories by World Bank staff; preparation of an environ- mental assessment report by the proponent; review of the report by World Bank staff; an appraisal mission in which World Bank staff discuss and resolve environmental issues with the proponent; documentation of the findings; and supervision and evaluation during project implementation (World Bank 1999). Between 1989 and 1995, the World Bank screened over a thousand projects for their potential environmental impacts: of these 10 per cent were in Category A (primarily energy, agriculture and transport projects), 41 per cent in Category B, and 49 per cent in Category C (World Bank 1997). Category A projects are those expected to have 'adverse impacts that may be sensitive, irreversible and diverse' (World Bank 1999), and they require a full EIA. For Category B projects, where impacts are 'less significant - not as sensitive, numerous, major or diverse', a full EIA is not required, but some environmental analysis is necessary. Category C projects have negligible or minimal direct disturbance on the physical setting, and neither Eli\ nor environmental analysis is required. Typical category C projects focus on education, family planning, health and human resource development.

Notable features of the World Bank process in- clude a holistic environment definition, including physical, biological and socio-economic aspects, a high profile for public consultation and con- siderable focus on project implementation. A report (World Bank 1995) identified five main challenges ahead: moving EIA 'upstream' (into project design stages and at sectoral and regional levels); more effective public consultation; better integration of EIA into the project work programme (including mitigation, monitoring and management plans); learning from implementation (the 'feedback loop'); and engaging the private sector (especially finan- ciers and project sponsors) to ensure that projects are subject to EIA of acceptable quality. Mercier (2003) reinforces the emphasis now placed on implementation of the mitigation, prevention and compensation measures contained in the EIA. Also, because many of the client countries now have their own EIA requirements and their own EIA staff and review mechanisms, the World Bank is increasingly involved in enhancing that capacity upfront during project

preparation.
The African Development Bank (ADB 2003) and European Investment Bank (EIB 2007) have less comprehensive EIA guidance, but both require EIA to be carried out, promote public participation in the EIA process, and take account of these when deciding on whether to fund a project. The ADB guidance is for integrated environmental and social impacts.
Other organizations have also published EIA guidance. For instance UNEP's very useful Environmental impact assessment training resources m111111al, now in its second edition (UNEP 2002), includes case studies (primarily from developing countries),

transparencies and detailed chapters on various • stages of EIA. The UK Department for International Development and the Ministry of Foreign Affairs • of Denmark have produced a similar guides (Dr-ID 2003; Danida 2009). Of particularly increasing importance are the Equator Principles, based on • both World Bank guidance, and on the Inter- national Finance Corporation (IFC) Performance Standards on social and environmental sustain- • ability. Equator Principle Financial Institutions, now including over 70 major national and inter- • national banks, commit to not providing loans to projects (>US$ I Om value threshold) where the borrower will not, or is not able, to comply with • domestic standards for EIA or international stand- ards, whichever is the highest (IFC, 2006).
more mandatory (gradual conversion of policy-based to law-based processes);
more closely monitored (by the courts, in- formed civil society bodies and government auditors);
more widely applied (through law at various levels, but also in land-use planning, through voluntary corporate initiatives, and so on); more integrative (considering systemic effects rather than just individual impacts);
more ambitious (overall sustainability rather than just individually 'acceptable' undertakings); and
more humble (recognizing and addressing uncertainties, applying precaution).

Almost 10 years later, this chapter shows that

In 2002, Gibson suggested that EIA worldwide has been moving towards being:

- earlier in planning (beginning with purposes and broad alternatives);
- more open and participative (not just pro- ponents, government officials and technical experts);
- more comprehensive (not just biophysical environment, local effects, capital projects, single undertakings);

these trends are still continuing a decade later. I Iowever, worldwide, EIA is still constrained by lack of political will, insufficient budget to implement proposed mitigation measures and lack of insti- tutional capacity, as noted earlier by Goodland and Mercier (1999). Emerging trends in Canada, Australia, the Netherlands (GHK 20 I 0) and else- where suggest that, even in developed countries, EIA also tends to be adapted - some might say watered down - where it is perceived to conflict with economic development.
Chapters 11 and 12 draw on some of the ideas discussed here, and elsewhere, to identify possibil- ities for the future, focusing primarily on the UK system, but set in the wider EU and global context.

SOME QUESTIONS

The following questions are intended to help the reader focus 011 the key issues o(this chapter.

Figure IO. I suggests that a greater number of EIAs arc carried out in more evolved EIA systems than in less evolved systems. Docs that, in turn, mean that one can tell how evolved a country's EIA system is on the basis of how many EIAs are carried out in that country? Explain your reasoning.

Compare two or three of the ElA systems described in this chapter with the UK system described at Chapter 3, or the US system of Section 2.2, in terms of: •
which projects require EIA, and how screening is carried out;

•
what an EIS must contain;

•
who carries out the EIA;

•
public involvement; and

transparencies

3
figure 10.2 suggests that more developed countries tend to have stronger EIA systems than less developed countries. However the EIA systems of Benin, Peru, China and Poland each have strong or innovative aspects that go beyond the UK or US systems. What arc these aspects, and why might they have been instituted?

4
The countries discussed in this chapter have widely varying approaches to the consideration of alternatives in EIA. Which has the strongest approach? The weakest?

S Peru and China allow only registered EIA experts to carry out EIA. What are the advantages and disadvantages of such an approach?

6
Peru's system can be criticised for having a 'poacher-gamekeeper' approach, where the ministry in charge of promoting certain projects is also responsible for the EIA process for those projects. Why is the term 'poacher-gamekeeper' used for such a scenario? Are there any other examples of 'poacher-gamekeeper' in this chapter?

7
The Western Australian EIA system is seen as one with many innovative features, which contribute to a good state system. What are these features? Are there also weaknesses?

8
Several of the international funding organisations require integrated environmental and social assessment. However individual countries' legislation focuses on environmental assessment. What might account for this discrepancy?

9
The World Bank and other funding organizations have played a key role in the application of EIA in many developing countries. What are possible reasons for these organizations' interest in EIA?

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Part 4

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Prospects

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1 1 Widening the scope: strategic environmental assessment

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11.1 Introduction 11.2 Strategic environmental assessment (SEA)
EIA has increasingly been applied at the level of policies, plans and programmes (PPPs) as well as projects. In the USA, this so-called strategic environmental assessment (SEA) has been carried out in a relatively low-key manner since the 1970s as an extension of project EIA. In other countries, SEA roll-out has been slower but has caused more of a splash. The European SEA Directive of 2004 has led to significant changes in the planning system in some Member States, China has passed specific SE.A legislation in 2009, and SEA is also a strong growth area in other parts of the world.
This penultimate chapter discusses the need for SEA and some of its limitations. It reviews the status of SEA in the USA, European Union, UNECE, and China. It then discusses in more detail how the European SEA Directive is being imple- mented in the UK. It concludes with the results of recent research into the effectiveness of the SEA Directive. By necessity this chapter must radi- cally simplify many aspects of SE/\. The reader is referred to Sadler et al. (2010) and Therivel (2010) for a more in-depth discussion. Chapter 9 presents two SEA case studies.

Strategic environmental assessment can be defined as:

a systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure they are fully included and appropriately addressed at the earliest appro- priate stage of decision making on par with economic and social considerations. (Sadler and Verheem 1996)

1 1

Figure 11.1

Links between SEA and the PPP-making process

Strategic decision-making process

Determine purpose, vision and strategic objectives
+

Environmental input

+-- Determine appraisal objectives and indicators and define alternatives
Determine means by which objectives Predict and evaluate impacts of alternative will be achieved; choose between strategic actions
alternatives

Fine-tune chosen alternative; determine how it will be implemented
+
Formal decision
+
-t--- Mitigate environmental impacts of chosen action; include criteria for lower-level decisions

-+--- (SEA report and consultation)
Announcement of strategy

Implement strategy and monitoring

The definition distinguishes between policies, plans and programmes (PPPs). Although they are often lumped together in the SEA literature, PPPs are not the same things, and may require quite different forms of SEA. A policy is generally defined as an inspiration and guidance for action (e.g. 'to supply electricity to meet the nation's demands'), a plan as a set of co-ordinated and timed objectives for the implementation of the policy (e.g. 'to build X megawatts of new electricity generating capacity by 2020') and a programme as a set of projects in a particular area (e.g. 'to build four new combined cycle gas turbine power stations in region Y by
-- Establish environmental guidelines for implementation

2020') (Wood 1991). PPPs can relate to specific sectors (e.g. transport, mineral extraction) or to all activities in a given area (e.g. land use, develop- ment or territorial plans).
In theory PPPs arc tiered: a policy provides a framework for the establishment of plans, plans provide frameworks for programmes, programmes lead to projects. In practice, these tiers are amor- phous and fluid, without clear boundaries. SEAs for these different PPP tiers can themselves be tiered, as shown in Figure 11.2, so that issues considered at higher tiers need not be reconsidered at the lower tiers. PPPs can also result in activities

Objectives
l
Policy SEA
/

TIER 1

TIER 2

Figure 11.2

Programme SEA
/j

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Programme

SEA
I

Programme
SEA

,,,./ l

TIER 3
Tiers of SEA and EIA
Project EIA Project EIA
Project EIA TIER 4
Table 11.1 Main differences between SEA and EIA

SEA EIA

Nature of the action Strategy, visions, plans

Scale of impacts Macro: global, national, regional

Timescale Long to medium term

Data Mainly descriptive but mixed with quantifiable/mappable

Alternatives Fiscal measures, economic, social or physical strategies, technolog,es, spatial balance of location

Assessment benchmarks Sustainability criteria and objectives Rigour/uncertainty Less rigour, more uncertainty Outputs Broad brush
Construcbon/operation actions Micro: local, site
Medium to short term

Mainly quantifiable/mappable

Specific alternative locations, design, timing

Legal restrictions and best practice More rigour, less uncertainty Detailed
Source: Based on Partidario (2003)

that have environmental impacts but are not development projects, such as privatization, different forms of land management, or indeed the revocation of a plan. Table 11.1 summarizes some of the major differences between EIA and SEA.

Various arguments have been put forward for a more strategic form of EIA, most of which relate to problems with the existing system o(project EIA. Project EIAs react to development proposals rather than anticipating them, so they cannot steer devel- opment towards environmentally robust areas or away from environmentally sensitive sites.
Project EIAs do not adequately consider the cumulative impacts caused by several projects, or even by one project's subcomponents or ancillary developments.1 For instance, small individual mineral extraction operations may not need an EIA, but the total impact of several of these projects may well be significant. Section 9.5 provides another example. At present in most countries there is no legal requirement to prepare compre- hensive cumulative impact statements for projects of these types.
Project EIAs cannot consider the impacts of potentially damaging actions that are not regulated through the approval of specific projects. Examples of such actions can include farm management practices, privatization and new technologies such as genetically modified organisms. Project

EIAs do not consider how much total development of a particular type is needed, and so they do not consider whether a given project is required at all. They also cannot fully address alternative types/ modes and locations for developments, or the full range of possible mitigation measures, because these alternatives will often be limited by choices made at an earlier, more strategic level. In many cases a project will already have been planned quite specifically, and irreversible decisions taken at the strategic level, by the time an EIA is carried out.
Table

Strategic environmental assessment can also help to promote sustainable development. In the UK, for instance, SEA is often expanded or integrated into sustainability assessment/appraisal. This not only involves broadening the scope of assessment to also consider social and economic issues, but also potentially setting sustainability objectives and testing whether the PPP will help to achieve them. In other words, sustainability assessment can test whether the PPP helps to promote a sustainability vision.

In the early days of SEA, lack of experience and appropriate techniques limited the quality of SEAs. As SEA practice has evolved, these problems have eased but others have emerged.
First, many PPPs are nebulous, and they evolve in an incremental and unclear fashion, so there is no clear time when their environmental impacts can be best assessed: 'the dynamic nature of the policy process means issues are likely to be rede- fined throughout the process, and it may be that a series of actions, even if not formally sanctioned by a decision, constitute policy' (Therivel et al. 1992). In practice, SEAs are often started late in the plan-making process, when major decisions have already been made. Second, where SEA is required only for programmes

and/or plans but not policies, as is the case with the European SEA Directive, an environmentally unfriendly policy can lead to environmentally unfriendly plans: in such a case, the plan-level SEA can at best mitigate the plan's negative impacts, not consider more sustainable policy level alternatives.

Third, and as noted in Chapter 1, strategic levels of assessment of plans and programmes should provide useful frameworks for the more site specific project assessments, hopefully reducing workload and leading to more concise and effective EIAs. But the anticipated tiered relationship has proved to be more in theory than practice, leading to unnecessary and wasteful duplication of activity. Fourth, multiple PPPs often affect a single area or resource. For instance, energy and transport PPPs - and many others - affect climate change. Waste and minerals PPPs are often integrally inter- connected, as are land-use and transport PPPs. As such, it is often difficult to assess a PPP on its own. There has also been considerable uncertainty about whether SEA should be broadened out to also cover social and economic issues. Considering environmental issues separately from social and economic issues may give them an additional 'weight' in decision-making and helps to keep the integrity of the environmental assessment. On the other hand, sustainability appraisal (SA) more closely reflects actual decision-making, and is legally required for many UK PPPs anyway, so inte- grating the two procedures makes sense in terms of efficiency.

Finally, and most importantly, policy making is a political process. Decision-makers will weigh up the implications of a PPP's environmental impacts in the wider context of their own interests and those of their constituents. SEA does not make the final decision: it merely (sometimes maddeningly so) informs it.

11 .3 SEA worldwide

Despite these problems, SEA has been increasingly carried out worldwide. For instance, the USA, European Union Member States, and China have all established SEA regulations; Canada requires SEA by cabinet decision; South Africa has guidance on SEA; and SEAs are regularly carried out in Hong Kong and elsewhere. This section discusses the SEA systems of the USA, the EU and UNECE because they arc well developed and demonstrate a range of possible approaches. rhcy differ in terms of whether they require or just encourage the preparation of SEAs; the types of strategic actions that require SEA; whether the SEAs consider only environmental issues or the full range of sustain- ability considerations; and the level of detail that they go into.

help to
promote

Federal actions significantly affecting the waste management (Department of Energy), and quality of the human environment, a detailed restoration of the impacts of the Deepwater Hori- statement by the responsible official on zon oil spill (National Oceanic and Atmospheric Administration and others).

- any adverse environmental effects that cannot be avoided should the proposal be implemented;
- alternatives to the proposed action;
- the relationship between local short-term uses of man's environment and the main- tenance and enhancement of long-term productivity; and
- any irreversible and irretrievable commit- ments of resources that would be involved 11.3.2 Federal

in the proposed action should it be implemented. (42 USC §4332)

The term 'federal actions' has been interpreted through Council on Environmental Quality regula- tions (CEQ 1978) as meaning 'new and continuing activities, including projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies;

new or revised agency rules, regulations, plans, policies, or pro- cedures; and legislative proposals'. For such PPPs, federal agencies must prepare up to three stages of progressively more detailed assessment, until they can show that the next stage is not needed: (1) an intial analysis that includes a test of 'cat- egorical exclusion' (a previous determination that the action would not result in significant environ- mental impacts); (2) environmental assessment; and (3) programmatic environmental impact statement (PEIS). If the environmental assessment stage determines that the action would not require a full PEIS, it instead concludes with a finding of no significant impact (FONS!) or a 'mitigated FONSI,' which shows that, with mitigation, the action would not have significant environmental impacts. Hundreds of PEISs have been prepared to date under the NEPA, although these form only a small percentage of all the assessments carried out in the USA. Recent PE!Ss include those for wind energy development on western public lands (Bureau of Land Management), solar energy development in six southwestern states (Office of Energy Efficiency and Renewable Energy and others), radioactive

Only a few of the USA's 50 states have SEA regulations. Of these, the SEA system established by the California Environmental Quality Act of 1986 (State of California 1986) is the most well developed. 'Program environmental impact reports' (PE!Rs) are required for series of actions that can be characterized as one large project and are related geographically, as logical parts in a chain of contemplated actions, in connection with the issuance of rules or regulations, or as individual activities carried out under the same authority and having generally similar environmental effects (CEQA 15168). Like project E!As, PE!Rs must include a description of the action, a description of the baseline environment, an evaluation of the action's impacts, a reference to alternatives, an indication of why some impacts were not evalu- ated, the organizations consulted, the responses of these organizations to the EIS and the agency's response to the responses.

In conjunction with the 40th anniversary of NEPA, the Council on Environmental Quality prepared draft guidance on aspects of SEA that they felt needed to be modernised and strength- ened: when and how Federal agencies must consider greenhouse gas emissions and climate change in their proposed actions; the appropriate- ness of FONSls and when environmental mitiga- tion commitments need to be monitored; the use of categorical exclusions; and enhanced public tools for reporting on NEPA activities (CEQ 2010).

Directive, the SEA Directive does not have a direct effect in individual European Member States, but instead needs to be interpreted into regulations in each Member State. Section 11.4 discusses how this has been done in England.

Directive 2001/42/EC requires SEA for plans and programmes (not policies) that:

1 are subject to preparation and/or adoption by an authority and

2 are required by legislative, regulatory or administrative provisions and

3 are likely to have significant environmental effects a11cl

4 (a) are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecom- munications, tourism, TC&P or land use a11d set the framework for development consent of projects listed in the EIA or (b) in view of the likely effect on sites, require an appropriate assessment under the Habitats Directive or

(c) arc other plans and programmes deter- mined by Member States to set the framework for future development consent of projects. 11.3.3

China

(a) An outline of the contents, main objectives of the plan, and relationship with other relevant plans and programmes.

(b) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan.

(c)
The environmental characteristics of areas likely to be significantly affected.

(d)
Any existing environmental problems that are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/40g/EEC and 92/43/EEC.

(e)
The environmental protection objectives, established at international, community or national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation.

(f)
The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectura and archaeological heritage, landscape and the interrelationship between the above factors. (These effects should include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects).

(g)
The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment

(h)
An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.

(i)
A description of measures envisaged concerning monitoring in accordance with Article 10.

(j)
A non-technical summary of the information provided under the above headings.

Box 11.1 summarizes the SEA Directive's requirements. Draft plans and programmes must be accompanied by an 'environmental report' that discusses the current baseline, the likely effects of the plan or programme and reasonable alternatives, how the negative effects have been minimized and proposed monitoring arrangements. The public must be consulted on the proposed plan or programme together with the environmental report, and the authority preparing the plan or programme has to show how the information in the report and the comments of consultees have been taken on board. European guidance (EC 2003) gives more details on some aspects of the Directive. In May 2003, the United Nations Economic Commission for Europe (UNECE) adopted an SEA Protocol similar to the European SEA Directive as a supplement to its 1991 Convention on EIA in a Transboundary Context (the Espoo Convention). The Protocol's requirements are broadly similar to, and compatible with, those of the EU Directive. Broadly, the same types of plans and programmes require SEA under the Protocol; the environmental report required by the Protocol is similar to that required by the Directive, and the consultation requirements are similar. rhe Protocol is more focused on health impacts, makes more references to public participation, and addresses policies and legislation, although it only requires SEA of plans and programmes. Although negotiated under the UNECE (which covers Europe, the USA, Canada, the Caucasus and Central Asia), the Protocol is open to all UN members. It entered into force in July 2010, and currently (May 2011) has 38 signatories and 22 parties.

Compared with the US and Europe, SEA practice in China is still in its relatively early days. SEA has been required in China since the Environmental Impact Assessment Law, which applied to both plans and projects, became operational in Septem- ber 2003. In August 2009, the Chinese government published new regulations, based on the EIA Law, but which apply specifically to plans.

Two types of plans require SEA in China. The shorter Type A process relates to land use plans, regional development plans, watershed and marine development plans, construction and utilization plans, and high-level conceptual plans. For such plans, the planning authority must prepare an environmental chapter or note that must be made publicly available, and must be submitted to the authorization authority alongside the draft plan.

rhe more rigorous Type H SEA process is required for a range of sectoral plans, for instance for industry, agriculture, energy and transport. Drafts of these plans must be accompanied by a full environmental impact report (EIR); the planning authority must seek the opinions of relevant institutions, experts and the general public on the draft plan and its EIR; it must arrange follow-up meetings with various parties if they have strongly divergent views; and it must include details in the final EIR of whether the opinions were adopted. The relevant environmental pro- tection authority must form a review group that examines the EIR and submits its opinion, and the authorization authority must use this opinion as the main basis for its decision on the plan.

The Chinese SEA system has particular strengths: the quality check of Type B plans'

Preparing an environmental report in which the likely significant effects on the environment of implementing the plan, and reasonable alternatives taking into account the objectives and geographical scope of the plan, are identified, described and evaluated. The information to be given is (Article 5 and Annex I}:

of implementing the plan.

The report must include the information that may reasonably be required taking into account current knowledge and methods of assessment, the contents and level of detail in the plan, its stage in the decision-making process and the extent to which certain matters are more appropriately assessed at different levels in that process to avoid duplication of the assessment (Article 5.2).

Consulting

- Authorities wrl:h environmental responsibilities, when deciding on the scope and level of detail of the information that must be included in the environmental report (Article 5.4).
- Authorities with environmental responsibilities and the public, to give them an early and effective opportunity within appropriate time frames to express their opinion on the draft plan and the accompanying environmental report before the adoption of the plan (Articles 6.1, 6.2).
- Other EU Member States, where the implementation of the plan is likely to have significant effects on the environment in these countries (Article 7).

Taking the environmental report and the results of the consultations into account in decision-making (Article 8) Providing infonnation on the decision:

When the plan is adopted, the public and any countries consulted under Article 7 must be informed and the following made available to those so informed:

- the plan as adopted;
- a statement summarising how environmental considerations have been integrated into the plan and how the environmental report of Article 5, the opinions expressed pursuant to Article 6 and the results of consultations entered into pursuant to Article 7 have been taken into account in accordance with Article 8, and the reasons for choosing the plan as adopted, in the light of the other reasonable alternatives dealt with; and
- the measures decided concerning monitoring (Article 9).

Monitoring the significant environmental effects of the plan's implementation (Article 10)
Source: EC 2001

Box 11.1 Requirements of the EU SEA Directive

E!Rs, the formal requirement for authorization authorities to give considerable weight to SEA findings, and the emphasis on cumulative impacts and carrying capacities. A monitoring and follow- up process compares the actual impacts of implementing Type B plans against those predicted in the EIR. Weaknesses to date include SEAs not being carried out for relevant plans, or being carried out too late in the plan-making process to influence the plan; and the fact that most of the people who carry out SEA in China are project Eli\ experts, so the resulting SEAs often feel like modified E!As (Therivel 2010).

11.4 SEA in the UK

The SEA Directive has had a huge influence on SEA practice in Europe, and, indirectly through the UNECE Protocol, worldwide. This section considers SEA practice in the UK as an example of this influence: the history and legislation of SEA and issues raised by these; typical steps involved in SEA; and effectiveness of SEA in the UK.

In the UK, in response to early government guid- ance, an abbreviated form of SEA - 'environmental appraisal' - was widely carried out from 1990. Environmental appraisal focused on testing the impacts of a draft plan against a 'framework' of environmental objectives. It required no collection of baseline evidence or policy context, considera- tion of alternatives, or monitoring. In 1999, new government guidance advised planning authorities to consider their plans' social and economic as well as environmental effects in a broader 'sustainability appraisal'. By October 2001 over 90 per cent of English and Welsh local authorities and all regional authorities had had some experience with appraisal. About half of the appraisals were 'environmental' and the other half 'sustainability' (Therivel and Minas 2002).

The implementation of the SEA Directive in 2004 led to much more formal, rigorous and detailed SEAs. In the UK, the SEA Directive is being implemented through different regulations in England, Wales, Scotland and Northern Ireland, supported by a jointly agreed Practical Guide to the SEA Directive (ODPM et al., 2006). Box 11.2 shows the SEA steps recommended in the Practical Guide: these clearly link to the requirements of the SEA Directive, but include some additional stages (A4, Bl, D2, E2) which reflect the UK's plan-making process. Further guidance by other government bodies addresses how to consider specific topics such as climate change and biodiversity in SEA (e.g. Environment Agency 2011; CCW 2009), and how to carry out SEA for specific types of plans (e.g. PAS 2010; DfT 2009).

(A) Setting the context and objectives, establishing the baseline and deciding on the scope
(A1) Identifying other relevant plans, programmes and environmental protection objectives
(A2) Collecting baseline information (A3} Identifying environmental problems (A4) Developing SEA objectives
(A5) Consulting on the scope of SEA

(8) Developing and refining alternatives and assessing effects
(B1) Testing the plan or programme objectives against the SEA objectives
(B2) Developing strategic alternatives
(B3) Predicting the effects of the draft plan or programme, including alternatives
(B4) Evaluating the effects of the draft plan or programme, including alternatives
(B5) Considering ways of mitigating adverse effects (B6) Proposing measures to monitor the environmental effects of plan or programme implementation

(C)
Preparing the Environmental Repon

(D)
Consulting on the draft plan or programme and the Environmental Report

(D1) Consulting on the draft plan or programme and Environmental Report
(D2) Assessing significant changes
(D3) Decision making and providing information
(E)
Monitoring implementation of the plan or programme (E1) Developing aims and methods for monitoring 11.4.2
The SA/SEA process in

(E2) Responding to adverse effects Source: ODPM el al. 2006

(A)

Much of the discussion - still ongoing - about how to implement the SEA Directive in the UK has been about how SEA should relate to sustainability appraisal (SA). The Planning and Compulsory Purchase Act 2004, which was enacted only two months before the UK legislation implementing the SEA Directive, requires SA for regional and local level spatial plans in England and Wales, without specifying what these SAs should include or how they should relate to SEA. Subsequent guidance (ODPM 2006) suggested that joint SA/SEAs - essentially SEAs with a wider remit that also covers social and economic issues - should be prepared for such plans rather than, say, separate SEA and SA reports, or an 'SA addendum' to a central SEA report. Because regional and local level spatial plans account for a large proportion of all plans in England and Wales, UK authorities' past wider experience of SA, and government requirements regarding sustainable development, most other plan SEAs in England and Wales are also broadened out to SA/SEAs. The same does not hold true in Scotland and Northern Ireland, which require only SEA.

practice
Prior to the SEA Directive, SAs of plans in the UK were mostly carried out in-house by the planners themselves. Post-Directive, some SA/SEAs are carried out completely in-house, some completely by consultants, and some by a mixture of con- sultants and in-house planners. There is no clear trend in who is carrying out SA/SEAs, nor what approach leads to the most changes to the plan or the most sustainable plan (Therivel and Walsh 2005; Sherston 2008). Very roughly, an SA/SEA will take 60-100 person days. The rest of this section discusses what carrying out a typical SA/SEA for a spatial plan would involve.

(A)
Setting the context and objectives, establishing the baseline and deciding on the scope

The analysis of other relevant plans, programmes and environmental objectives is typically very comprehensive and seriously boring. It is usually presented as a long table that lists the other plan, what the other plan says, and what implications this has for the plan in question.

In the first few years after the SEA Directive was implemented, baseline infonnation was also mostly presented in tables, which showed baseline data for the local authority, similar data at the regional and/or national level as a comparator, relevant targets, and data sources. The tables were quick to compile and allowed the authority to benchmark its baseline, but were difficult to read and provided no spatial information. More recently, SA/SEA baseline descriptions have become more descriptive and spatial, for instance showing maps of nature conservation areas or landscape designations, and in some cases providing overlay maps of constraints or opportunities. Figure 11.3 shows an example.

Part of the baseline description also includes predicting the likely future situation in the absence o(tlze plan. For instance, air quality is expected to improve in the UK generally due to tightening European standards for vehicle emissions and the closure of some power stations as a result of the Large Combustion Plant Directive; and the marine areas around the UK are expected to be subject to many more impacts as a result of govern- ment policies on offshore energy production. This information allows the cumulative impacts of the plan - the plan plus other plans, projects and baseline trends - to be assessed.

Existing e11viro11me11tal or sustainability problems are often identified as a group exercise. Problems include where environmental targets are not achieved, environmental standards are exceeded, the plan area is doing worse than other similar areas, the situation is worsening over time, and things that local residents are unhappy about.

For objectives-led SA/SEAs, an SA/SEA framework of environmental, social and economic objectives and indicators would then be set up. This will act as an independent 'measuring stick' or series of questions against which the plan's impacts can be tested. The indicators are also useful for describing and monitoring the baseline environment. Table 11.2 shows part of a typical SA/SEA framework. For baseline-led SA/SEAs, no such framework would be prepared.

All of this information is collated into a scoping report, which is sent to the statutory consultees (in England these are the Environment Agency, Natural England and English Heritage) for five weeks, to allow them to comment on it.

(B)

Developing and refining alternatives and assessing effects

1

Help deliver equality of opportunity and access for all

2

Maintain and improve air quality

3

Protect and enhance biodiversity, flora and fauna

The SEA Directive requires the environmental report to evaluate the effects of the plan 'and reasonable alternatives taking into account the objectives and the geographical scope of the plan'. Although guidance exists on altematives ide11tifica- tio11 (PAS 2008) and the quality of the alternatives being considered in SA/SEAs is generally improv- ing, historically this stage has not been done well, and some SA/SEAs continue to limit their consideration of alternatives to a comparison of the proposed plan vs. no plan. Most of the successful SEA-related legal challenges in the UK have been around the development and assessment of alterna- tives. For instance, concerning a proposal in the East of England Regional Spatial Strategy to build housing on the Green Belt, Justice Mitting con- cluded that

[The SEA Directive] required that reasonable alternatives to the challenged policies be identified, described and evaluated before the choice was made. The environmental report produced by ERM did not attempt that task. It should have done so and the Secretary of State should not have decided to adopt the challenged policies until that had been done. The consequence of omitting to comply with the statutory requirement is demonstrated by the outcome. A decision has been made to erode the metropolitan green belt in a sensitive area without alternatives to that erosion being considered.2

Similarly, Justice Collins ruled in 201 I that:

It was not possible for the consultees to know from [the SEA for the forest Heath Core Strategy] what were the reasons for rejecting any alternatives to the urban development where it was proposed or to know why the increase in the residential development made no difference. The previous reports did not

Table 11.2 Example of part of a typical SA/SEA framework

SA/SEA objective Sub objective: will !he plan Indicators

1 (a) Address existing imbalances of inequality, depriva1ion and exclusion
1 (b) Improve access lo education, lifelong learning and training opportunities
1
(c) Improve accessibility lo affordable housing and employment opportunities, particularly for disadvantaged sections of society
1.1
Percentage of areas in 1he most deprived

1.2
Average house price compared to average

1.3
Number and percentage of affordable housing units provided per year

1.4
Number of homeless per 1000 households

3.1
Number and extent (in hectares) of enhance designa1ed sites of importance

3.2
Area of ancien1 woodland cover

3.3
Total extent (in hectares) of priority habitats

3.4
Percentage of fea1ures of internationally and nationally designa1ed sites in favourable condition

3 (a) Maintain and achieve favourable condi1ion of in1ema1ional and na1ional si1es of nature conserva1ion importance
3 (b) Maintain the exten1 and enhance 1he quali1y of locally designated sites and priority habitats
3 (c) Main1ain and enhance connectivity of corridors of semi-na1ural habita1s
10% areas
amual salary
2.1 Number of air quality management areas

I Are11 of Out&tandirlg
1 Natural Beauty (AONBJ
i-1Nlllure oonNMllion
-- ¦II¦cl Europe11n
impor'lanoll
Urblln exten111011
1

Major h•torical IIUels - rele11&e lull polenlial &. in1111grilllll wilh IDwn
Heritllae Cmlll

Figure 11.3

Example of a strategic level constraints map
Source: Dover Dis1rict Council (2010)

properly give the necessary explanations and reasons and in any event were not sufficiently summarized nor were the relevant passages identified in the final report.3

The relevant parts of both plans were quashed.

Objectives-led impact assessment involves testing how well each plan alternative or sub-component fulfils each SA/SEA objective in the SA/SEA frame- work. Table 11.3 shows an example of how plan alternatives can be assessed and compared. In each case, the table cells are filled in, alternative by alternative or sub-component by sub-component, noting whether the alternative/sub-component:

- is clearly written: if not, it might be possible to rewrite it to make it clearer;
- has a negative impact (-): if so, this impact might be mitigated, for instance by rewriting the sub-component, adding a different sub- component, etc.;
- has a positive impact (+): if so, it might be possible to rewrite it to make it even more positive;
- has an uncertain impact (?): if so, it may be necessary to collect further information before the assessment can be completed, and the plan finalized;
- has an impact that depends on how the plan is implemented (I): if so, it may be possible to rewrite the plan to ensure that it is imple- mented positively; has no significant impact (0).

Baseline-led impact assessment, instead, in- volves comparing the expected 'with plan' situa- tion against the expected 'without plan' situation, and determining whether the plan would change things for better or worse. Where the 'with plan' situation would be significantly worse than the 'without plan' situation, mitigation measures would be considered.

rhe focus of the assessment stage should not be on the symbol or the precise quantity of change, but rather on making appropriate changes to the plan: these are the mitigation measures required

by the SEA Directive. The Directive implies a hierarchy of mitigation. Avoidance or prevention of impacts, for instance by moving proposed development away from a sensitive site or not allowing certain
types of activities, is generally considered preferable to reduction or minimisation of impacts, for instance requiring developments to use certain technologies or achieve certain standards. Com- pensatory measures or offsets - allowing the impacts to happen to providing some kind of counterbalancing benefit - is the least preferable measure.
A given plan may require several rounds of impact assessment and mitigation, at different levels of detail, during the development of the plan:

- Broad strategic alternatives (e.g. whether housing should be at the edge of existing towns, scattered throughout an authority or in one large new town). These may need to be evaluated and compared early in the plan- making process before preferred alternative(s) can be agreed on.
- More detailed sub-components of the plan (e.g. plan policies on housing density and design). These may need to be evaluated and fine-tuned once the plan is closer to completion.
- Proposed locations for development (e.g. specific housing sites). These may need to be evaluated and fine-tuned at a level of detail close to that of project EIA.

(C) Preparing the Environmental Report

l'he findings of Stages A and B arc published in an SA/SEA (or Environmental) Report alongside the draft plan, and made available to the public and statutory consultees. The Environmental Report also covers the remaining requirements of the SEA Directive, namely any problems faced in compiling the information in the report, and proposed monitoring arrangements.

(D) Consulting on the draft plan or programme and the Environmental Report

After the consultation responses have been received, they must be 'taken into account' in the final plan. Once the final plan has been agreed, it must be published alongside a statement that explains how the authority has taken the findings of the SA/SEA and the consultation responses into

Table 11.3 Example of part of a typical objectives-led assessment

SA/SEA objeciive Alternative

Develop site X for employment Develop site X for housing Protect site X from development for the plan period

1 Help deliver equality of opportunity and access for all

2 Maintain and improve air quality

Takes up land that could potentially be used for housing

Would support employment that requires road access

Would add to congestion, but could shorten the length and duration of some journeys
0 (no change)
3 Protect and enhance ? 0 (no change)
biodiversity, flora and fauna Status of biodiversity is unclear - requires further study

account, and 'the reasons for choosing the plan ... as adopted, in the light of the other reasonable alternatives dealt with'. The statement must also confirm the monitoring measures that will be carried out.

(E)
Monitoring the implementation of the plan 11.4.3
SA/SEA effectiveness in the UK •

Finally, the authority must monitor the significant environmental impacts of the plan's implemen- tation.

greater understanding of their plan and of sus- tainability issues, more transparent plan-making, and inspiration for the next round of plan-making: see Figure l l.6. Planners also feel that the SA/SEA process, although itself biased slightly towards the environment, balances out the plan-making process that itself is biased in favour of social and economic concerns (Sherston 2008; Yamane 2008). The DCLG (2010) research concluded with a range of recommendations for improving SA/SEA, many of which are also relevant for project-level EIA:

A sequence of surveys of UK planners (Therivel and Minas 2002; Therivel and Walsh 2005; Sherston 2008; Yamane 2008) has given an indication of the effectiveness of the UK SA/SEA system, and changes • to that system triggered by the SEA Directive. In terms of direct effects, more than 80 per cent of planners report that the SA/SEA process has led to • some changes being made to their plan, with the SEA Directive leading to a noticeable increase in • this. However most of these changes are limited to additions, deletions or rewording of individual plan policies, with only a limited number of plans being substantially changed as a result of SA/SEA (see Figures 11.4 and 11.S). This is con- • firmed by recent DCLG research which concludes that 'SA/SEA generally plays a "fine-tuning" rather • than a "plan-shaping" role' (DCLG 2010).
Planners reported, however, that SA/SEA has • considerable additional indirect benefits, including

Planning bodies should integrate the early, evidence gathering stages of the plan-making and SA/SEA processes in order to foster a more efficient and effective approach.
The evidence base for SA/SEA should include a greater focus on sptaial information and reflect the spatial nature of the plan.
The scope of the appraisal should reflect the alternatives being considered.
Those undertaking the appraisal should not be afraid to omit from its scope issues that are not likely to be significant; however, this should be done transparently with a clear explanation.
Plan-making should generate well thought out and clearly articulated alternatives.
Plan impacts should be identified and evalu- ated with reference to the baseline situation. The level of detail the appraisal enters into should reflect the level of detail in the plan.
The appraisal should consider the extent to which options and policies will be effectively delivered on the ground to help avoid un- realistic assessment results.

- Separate, understandable non-technical sum- maries of SA/SEA reports should be prepared • to facilitate public engagement.

- There is further scope to engage the public in SA/SEA, particularly through the use of stakeholder events focused on options.

- Some topic-specific assessments can be inte- grated into the SA/SEA process, but Habitats

Regulations Assessment should be undertaken on a largely separate basis.
!"hose undertaking the appraisal should ideally provide plan-makers with explicit recommen- dations to which they can respond.
Links between SA/SEA and Annual Monitoring Reports should be strengthened with signifi- cant effects identified by the appraisal moni- tored through indicators included in the Annual Monitoring Reports. See Hanusch and Glasson (2008) for discussion of importance of monitoring in SEA/SA.

Figure 11.4

Proportion of plans changed as a result of SA/SEA in 2002, 2005 and 2008

2008

2005

2002

0% 20% 40% 60% 80% 100%

D Changes
¦
No changes

Figure 11.5

Type of changes, 2008
eo --------------------

&o+ ---------------------------------- l

40· j

30+ 7
20+

7

l:+--------e---
Whole approach
Significant alternatives
Develop sites
Policies added/removed

Figure 11.6

Gives greater awareness of sustainability issues
Gives greater understanding
of plan
Inspiration for next round of
plan-making
Plan-making process more transparent

D Agree strongly
D Agree
12:I Indifferent
¦
Disagree

¦
Disagree strongly

Generates significant public
Indirect benefits of SA/SEA
interest

0% 20% 40%

60% 80% 100%

11.5 Summary

SEA has spread and evolved rapidly over the last decade, and is likely to continue to do so for the foreseeable future. Its main limitation is, like that of EIA, that its findings only have to be 'taken into account'. In practice, this still leads to economic and social issues frequently being prioritized over environmental issues (Therivel et al. 2009).
However, impact assessment at the strategic rather than just the project level allows for an improved consideration of wider issues (such as climate change and deprivation), consideration of more strategic alternatives (such as how much develop- ment is needed and broadly where it should go) and better analysis of cumulative impacts. These all set a useful framework for project development and project-level EIA. These themes are taken further in the final chapter on prospects in EIA.

SOME QUESTIONS

The following questions are illtended to help tile reader focus 011 the key issues of" this

chapter, and to
start building some 1111derstm1di11g about SEA and the strategic level of" assessme11t.

In the UK, SEAs are typically widened out to also consider social and economic topics. What are the advantages and disadvantages of such an approach?

2 One argument put forward for needing SEA is that E!As do not adequately address cumulative impacts. Of the three SEA systems described in Section 11.3, do any clearly consider cumulative impacts?

3 Figure 11.3 shows a constraints map for an urban extension proposal. How is it different from the project-level constraints map of Figure 4.8? What might account for the differences?

4 Table 11.2 shows an example of a strategic level of impact assessment. How does this differ from the project-level techniques of Chapter S? What might account for the differences?

S Figure 11.6 shows that planners find that SEA helps them to have greater understanding of their plan. Why might that be the case?

6 Of the problems with EIA listed in Section 11.2.2, can you provide any specific examples from your own EIA practice, or find any in the rest of this book? Do you think that SEA, as described in this chapter, solves these problems?

Notes References

See Section 12.3 for a discussion of cumulative topic impacts and Sections 9.8 and 9.9 for two UK case studies.

2 City and District Council of St. Albans vs. Secretary of State for Communities and Local Government, [2009] EWHC 1280 (Admin).

3 Save Historic Newmarket Ltd and others vs. Forest Heath District Council and others, (20111 EWHC 606 (Admin).

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12 Improving the effectiveness of project assessment

Overall, the experience of EIA to date can be summed up as being like the proverbial curate's egg: good in parts. Current issues in the F.IA process were briefly noted in Section 1.6: they

include EIA methods of assessment, the quality and efficiency of the EIA process, the relative roles of the participants in the process, EIS quality, monitoring and post-decision, managing the widening scope and complexity of impact assessment activity, plus concern about its overall effectiveness. The various chapters on steps in the process have sought to identify best practice, and Chapter 8 provides an overview of the quantity and quality of UK practice to date. Detailed case studies of good practice and comparative international experience provide further ideas for possible future developments. The evolving, but still in some cases limited, experience in EIA among the main participants in the process
- consultants, local authorities, central govern- ment, developers and affected parties - explains some of the current issues.

However, almost 25 years after the implemen- tation of EC Directive 85/337, there is less scepti- cism in most quarters and a general acceptance of the value of EIA. There are still some substantial

shortcomings, and there is considerable scope for improving quality, but practice and the underpinning knowledge and understanding have developed and EIA continues on its steep learning curve. The procedures, process and practice of EIA will undoubtedly evolve further, as evidenced by the comparative studies of other countries. The EU countries can learn from such experience and from their own experience since 1988.

This chapter focuses on the prospects for project-based EIA. The following section briefly considers the array of perspectives on change from the various participants in the EIA process. This is followed by a consideration of possible developments in some important areas of the EIA process and in the nature of EISS. The chapter concludes with a discussion of the parallel and complementary development of environmental management systems and audits. Together, these topics act as a kind of action list for future improvements to EIA.

Improving the
effectiveness

various chapters of this book. EIA systems and procedures are changing in many countries. Indeed, as O'Riordan (1990) noted (sec Section 1.4), we should expect EIA to change in the face of shifting environmental values, politics and managerial capabilities. This is not to devalue the achievements of £IA; as the World Bank (1995) noted , 'Over the past decade, £IA has moved from the fringes of development planning to become a widely recognized tool for sound project decision making.'

The practice of Eli\ under the existing systems established in the EU Member States has also improved rapidly (sec Chapters 2, 8 and 10). !'his change can be expected to continue in the future, as the provisions of the regularly amended EU EIA Directive work through, and even further amend- ments are introduced. Changes in EIA procedures, like the initial introduction of EIA regulations, can of course generate considerable conflict between levels of government: between federal and state levels, between national and local levels and, in the case of Europe, between the EU and its Member States. They also generate conflict between the other participants in the process: the developers, the affected parties and the facilitators (see Figure 3.1).

The Commission of the European Communities (CEC) is generally seen as positive and proactive with regard to EIA. The CEC welcomed the intro- duction of common legislation as reflected in Directive 85/337, the provision of information on projects and the general spread of good practice, but was concerned about the lack of compatibility of EIA systems across frontiers, the opaque processes employed, the limited access to the public and lack of continuity in the process. It pressed hard for amendments to the Directive, and has achieved some of its objectives in the various subsequent amendments. In addition the SEA Directive was implemented from 2004 (see Chapter 11). However, as noted in Section 2.8, there are some continuing and stubborn issues, including: variations in screening, transboundary issues, quality control, the absence of mandatory con- sideration of alternatives, lack of monitoring, and tiering issues between EIA and SEA (CEC 2009). The Commission is committed to reviewing and updating EIA procedures and there will no doubt be further changes. Other areas of attention
include, for example, cumulative assessment, public participation, economic valuation and EIA procedures for development aid projects. In contrast with the CEC, Member States tend to be more defensive and reactive. They are generally concerned about maintaining 'subsidiarity' with regard to activities involving the EU; this has been an ongoing issue with EIA (CEC 2009). Govern- ments are also sensitive to increasing controls on economic development in an increasingly difficult, competitive and global economy.

For example, within the UK govemment, the DCLG (formerly ODPM; DETR; Do£) has been concerned to tidy up ambiguities in the project- based procedures, and to improve guidance and informal procedures for example, but is wary of new regulations. However, it has commissioned and produced research reports, for example on an EIA good practice guide, on the evaluation and

review of environmental information and on mitigation in EIA, and its recent guidance and regulations reflect an acceptance of the value of EIA. Lorn/ government in the UK has begun to come to terms with EIA, and there is evidence that those authorities with considerable experience (e.g. Essex, Kent, Cheshire) learn fast, apply the regulations and guidance in user-friendly 'customized' formats to help developers and affected parties in their areas, and are pushing up the standards expected from project proponents. For example see the latest version of the very useful Essex Guide to EIA (Essex Planning Officers' Association, 2007) which can be freely downloaded.
Pressure groups - exemplified in particular in the UK by the Campaign to Protect Rural England (CPREJ, the Royal Society for the Protection of Birds (RSPB) and Friends of the Earth (FoEJ - and those parties affected by development proposals view project EIA as a very useful tool for increasing access to information on projects, and for advanc- ing the protection of the physical environment in particular. They have been keen to develop EIA processes and procedures; see, for example, the reports by CPRE (1991, 1992) and RSPB (2000). Many developers are less enthusiastic about streng- thening £IA procedures, but will welcome the government's recent clarification on ambiguities (DCLG 2011) - especially on whether E!As are needed in the first place for their particular projects. For facilitators (consultants, lawyers, etc.), EIA has

been a welcome boon; their interest in longer and wider procedures, involving more of their services, is clear.
Other participants in the process in the UK, such as the IEMA (see 12.3.2 below), academics and some environmental consultancies, are carrying out groundbreaking studies into topics such as best-practice guidelines, the use of monetary valuation and ecosystem services approaches in EIA and approaches to widening types of impact study. In addition, the production of several hundred EISs a year in the UK and in many other countries worldwide is generating a considerable body of expertise, innovative approaches and compara- tive studies. EISs are also becoming increasingly reviewed, and hopefully bad practice will be exposed and reduced. Training in EIA skills is also developing.

Examples of recent key international studies of EIA effectiveness include those by the European Commission, as already noted above and in Chapter 2 (CEC 2009), and the 2011 update of the 1996 Intemational study of the effectiveness of environmental assessment for the IAIA, by Sadler and colleagues (1996, 2011). As noted in Chapter 8, in a UK workshop discussion for the evolving international effectiveness study, Sadler (2010) identified an 'effectiveness triage' involving three clearance bars for EIA: what must or should be done, including legal and institutional framework and methodological realities; what is do11e, including cases of good practice; and what is the outcome, in particular the contribution to decision-making, and environmental benefits. He raises, for example, many questions about the second of the above, the nature of current practice. Is consultation a
procedural cornerstone or overrated and under- performing? Are screening and scoping focusing on the impacts that matter? Is the evaluation of significance based on adequate evidence? Are mitigation measures sufficiently tailored? Is moni- toring still the weak link? Such points resonate with much of the content in the very useful summary of international best and worst case EIA performance contained in the earlier international effectiveness study (Sadler 1996; see Box 12.1).
been a welcome boon; their interest in longer and
wider

procedures,

Box 12 .1 Summary of international best- and worst-case EA performances

Table 12.1 Key areas to deliver IEMA vision for EIA and to facilitate future success of UK EIA practice

A focus on communicating the added value generated by EIA: enhance the communication of the positive effects of EIA
{e.g. EIA leading to improvements in project design)

2
Realizing the efficiencies of effective EIA co-ordination: recognize the value that a good EIA co-ordinator brings to the efficient running and effective application of the assessment

3
Developing new partnerships to enhance the EIA process: value effective partnerships with planners; legal advisers: design teams; and construction contractors, etc.,especially those involved in managing EIA outcomes

4
Listening, communicating and engaging effectively with communities

5
Practitioners actively working together to tackle the difficult issues in EIA to generate pragmatic solutions to difficult EIA issues

6
Delivering environmental outcomes that work now and in the future: recognize the importance of designing measures in a way that maximizes the chance of 1heir being implemented effectively; plus effective monitoring

12.4
Possible changes in the 12.4.1
Cumulative impacts

Source: Adapted from IEMA (2011)

....

EIA process: more specific examples

So what might be done? A pragmatic approach to change could subdivide the future agenda into proposals to improve EIA procedures, usually sooner and maybe more easily than proposals to widen the scope of EIA, which are likely to come later and will probably be more difficult to implement. I111proveme11ts to project £IA cover some of the changes introduced by the various amendments to the EC Directive, including developments in approaches to screening, the mandatory considera- tion of alternatives and a strong encouragement to undertake scoping at an early stage in the project development cycle. There could also be more support for more transparent procedures, and encouragement for consultation, for the explana- tion and publication of decisions and for greater weight to be given to cumulative impacts and risk assessment.

The methods of assessment could also benefit from further attention. Uncertainty about the unknown may mean the EIA process starts too late and results in a lack of integration with the management of a project's life cycle. The EIA process and the resulting EISs may lack balance, focus on the more straightforward process of describing the project and its baseline environ- ment and consider much less the identification, prediction and evaluation of impacts. The fore- casting methods used in EIA are not explained in most cases (see Section 8.4). Practical advances in predicting the magnitude of impacts and deter- mining their importance (including the array of multi-criteria and monetary evaluation techniques) would be beneficial. A good 'method statement', explaining how a study has been conducted - in terms of techniques, consultation, the relative roles of experts and others - should be a basic element of any EIS.

Widening the scope of eia includes, in particular, the development of tiered assessment through the introduction of SEA (as discussed in Chapter 11). Another important extension of the scope of EIA includes 'completing the circle' through the more widespread use of monitoring and auditing. Unfortunately, this vital step in the EIA process is still not mandatory after several amendments to the EC Directive. More wide-ranging changes include the move to a 'whole of environment' approach, with a more balanced consideration of

both biophysical and socio-economic impacts. Such widening of scope should lead to more integrated EIA. There may also be a trend towards using ElA to identify environmental limits and environmental constraints on the project, rather than focusing only on identifying the project's impacts on the environment- through what might be termed environmental impact design. Testing a project's resilience to future changes and shocks could also become a component of EIA.
The following sections discuss possibilities for some of these short- and longer-term proposals: better consideration of cumulative impacts, widening the scope to include socio-economic impacts; embracing the growing areas of health impact assessment, equality impacts assessment, appropriate assessment and resilience thinking; building climate change centrally into EIA; developing integrated impact assessment and moving towards environmental impact design.

Many projects are individually minor, but collectively may impose a significant impact on the environment. Activities such as residential development, farming and household behaviour normally fall outside the scope of conventional EIA. The ecological response to the collective impact of such activities may be delayed until a threshold is crossed, when the impact may come to light in sudden and dramatic form (e.g. flooding). Odum (1982) refers to the 'tyranny of small decisions' and the consequences arising from the continual growth of small developments; cumulative impacts can also be described as 'death by a thousand cuts'. While there is no particular consensus on what constitutes cumulative impacts, the categorization by the Canadian Environmental Assessment Research Council (CEARC) (Peterson et al. 1987) is widely quoted, and includes:

- time-crowded perturbations: which occur because perturbations arc so close in time that the effects of one are not dissipated before the next one occurs;
- space-crowded perturbations: when perturba- tions are so close in space that their effects overlap;
- synergisms: where different types of perturba- tion occurring in the same area may interact to produce qualitatively and quantitatively different responses by the receiving ecological communities;
- indirect effects: those produced at some time or distance from the initial perturbation, or by a complex pathway; and
- nibbling: which can include the incremental erosion of a resource until there is a significant change/it is all used up.

Cumulative impact assessment is predicting and assessing all other likely existing, past and reasonably foreseeable future effects on the environment arising from perturbations which are time-crowded; space-crowded; synergisms; indirect; or, constitute nibbling. (CEl'A 1994)

The need to include cumulative impact assess- ment in EIA has been long recognized. In the CEQA of 1970, significant impacts are considered to exist if 'the possible effects of a project are individually limited but cumulatively consid- erable'. Subsequent legislative reference is found in the 1991 Resource Management Act of New Zealand, which makes explicit reference to cumulative effects, and now also in the amended EU Directive, which refers to the need to consider the characteristics of projects having regard to 'the cumulation with other projects'. In Canada, which has been at the forefront in the development of 'cumulative effects assessment' (CEA), the consid- eration of cumulative effects is explicit and mandatory in legislation both federally and in several provinces. The UK guidance is for rather more limited consideration of cumulative effects:

Generally, it would not be sensible to con- sider the cumulative effects with other applications which have yet to be deter- mined, since there can be no certainty that they will receive planning permission. How- ever, there could be circumstances where two or more applications for development should be considered together. For example, where
the applications in question are not directly in competition with one another, so that both or

all of them might be approved, and where the overall combined environmental impact of the proposals might be greater than the sum of the separate parts. (DCLG 2011)

However, it is in the practical implementation of the consideration of cumulative impacts that the problems and deficiencies become clear, and cases of good practice and, until recently, useful methodologies have been limited. In Australia, assessments have largely been carried out by regulatory authorities rather than by project proponents, and have focused on regional air quality and the quality and salinity of water in catchment areas (CEPA 1994). Figure 12.1 provides an example of a simple perturbation impact model developed by Lane and associates (I 988). It is basically an 'impact tree' that links (a) the principal causes driving a development with, (b) the main perturbations induced with, (c) the primary bio- physical and socio-economic impacts and (d) the secondary impacts. The figure shows some of the potential cumulative impacts associated with a number of area-related tourism developments.
There are some significant examples of good practice guidance. In the US, the CEQ produced a practice guide Considering cumulative effects (CEQ 1997), based on numerous case studies. The guide consists of 11 steps for CEA, in three main stages (see also Chapter 2, Section 2.2.4). In Canada, a Cumulative effects assessment practitioners guide (CEAA 1999) provides a very useful overview and clarification of terms and fundamentals, of practical approaches to completing CEAs, and case studies of approaches used by project proponents. The guide provides some clear and simple definitions - 'Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions. A CEA is an assessment of those effects.' Further Canadian work has sought to improve the practice of CEA (see Baxter et al. 2001). In the EU, there has also been an attempt to support practice in the area through the development of Guidance for the assessment ofindirect and rnmulative impacts (Hyder Consulting 1999). Piper (2000, 2001a, b) provides valuable evidence on the state of UK practice in

CAUSE PERTURBATION

Tourism '°" :::_:::----------i-- National Parks ---------------- -
Resorts Marinas

- Demographic change

.._
Airports Roads

Recreational fishing

Figure 12.1

Cumulative impacts: perturbation impact model
Source: Lane and assoc1aies 1988

PR IMARY IM PACT SECONDARY IMPACT

-7)--- Farm output decline
==-- Agriculture land alienation

and losses

I Wilderness loss ---

Habitat fragmentation and impairment

Adverse cultural change

-- Beach destabilization --
Rare and endangered
species loss

----Beach loss

Recreational fishing decline

Commercial fishing decline and losses

Table 12.2 Key steps in a CEAM framework

1	Initiate the CEA process by identifying the incremental direct ard indirect effects of the proposed project (or policy, plan or programme) on selected VECs (valued ecosystem components) within the environs of the project location.
2	Identify other past, present, ard reasonably foreseeable future actions within the space and time boundaries that have been, are, or could contribute to cumulative effects (stresses) on the VECs and their indicators.
3	For the selected VECs, assemble appropriate information on their indicators, and describe and assess their historical to current and even proJected conditions.
4	'Connect' the proposed project (or other PPP) ard other actions in the CEAM study study area to the selected VECs and their indicators.
5	Assess the significance of the cumulative effects on each VEC over the time horizon for the study.
6	For VECS or their indicators that are expected to be sub1ect to negative incremental impacts from the proposed project ard for which the cumulative effects are significant, develop appropriate acbon or activity-specific 'mitigaton measures' for such impacts.

12.4.2 Socio-economic impacts

Source: Adapted (substantially simplified) from Canter and Ross (2010)

CEA, drawing on research on a number of case studies (see Section 9.5).

Between them, these guides and assessments of practice highlight some of the key process and organizational issues in considering cumulative impacts/effects. Process issues include, for example: establishing the geographic scope of the analysis (how wide should the impacts region be), estab- lishing the time frame for the analysis (including not only present projects, but also those in the non-immediate time frame - past and reasonably foreseeable future) and determining the magnitude and significance of the effects. A key organizational question in the UK (sec Piper 2001b) is 'Which organization has the responsibility to require or commission the CEA work?' This is complicated when, as is often the case in CEA, there is more than one competent authority involved (Piper 200 I b; Therivel and Ross 2007).

Canter and Ross (2010) provide a recent state of play of CEAM (cumulative effects assessment and management); the inclusion of 'M' in the term reflects the increasing attention being given to the management and mitigation of cumulative effects. They identify a six-step framework, as set out in Table 12.2. They also discuss the good, bad and ugly lessons of the practice of CEAM. 'Good', for example, includes: adoption of a valued ecosystem component (VEC)-based perspective; agency/ proponent and public context scoping; use of scenarios where reasonably forseeable future actions are uncertain; and dissemination of good practice. Examples of 'bad' lessons include: over focus on biophysical environmental components at the expense of socio-economic; vague terms of reference for studies; inadequate guidance; lack of expertise and overcomplex studies. Downright 'ugly' include for example: minimal attention to CEAM; lack of commitment by key decision makers; lack of multi-stakeholder collaboration and - on occasion - an attitude that CEAM cannot be done. In this context, Canter et al. (2010) conclude: 'By all accounts, cumulative effects continue to be a persistent analytical challenge, although there is evidence of progress towards better practice.'

Widening the scope of EIA to include socio- economic impacts in a much better way is seen as a particularly important item for the agenda. Although most of the environmental receptors listed in EC and UK regulations are still biophysical in nature, the inclusion of 'human beings' as one of the receptors to be considered in EIA does imply a wider definition of 'the environment', encompassing its human (i.e. social, economic and cultural) dimensions. The inclusion of socio-economic impacts can help to better identify all of the potential biophysical impacts of a project, because socio-economic and biophysical impacts are interrelated (Newton 1995). Early inclusion of socio-economic considerations in the ElA can

provide an opportunity to modify project design or implementation to minimize adverse socio-economic effects and to maximize beneficial effects (Chadwick 2002). It also allows a more complete picture of a project's impacts, in a consistent format, in a publicly available document. Failure to include such impacts can lead to delays in the EIA process, since the competent authority may request further information on such matters.

While there are varying interpretations of the scope of socio-economic or social impacts, over time a number of reports have highlighted the importance of this area (see, for example, CEPA 1994; IAIA 1994; Vanclay 2003; Glasson 2009). SIA has been defined by Burdge (1999) as 'the systematic analysis, in advance, of the likely impacts a proposed action will have on the life of individuals and communities'. Most development decisions involve trade-offs between biophysical and socio-economic impacts. Also, development projects affect various groups differently; there are invariably winners and losers. Yet the consideration of socio-economic impacts is very variable in practice, and often very weak. Some countries have useful practice and associated legislative impetus for SIA (for example, the USA, Canada and some states of Australia). International funding institutions are also increasingly giving a high profile to such impacts, as shown at Section 10.9. llowever, in Europe the profile is lower, and the consideration of socio-economic impacts has continued to be the poor relation (Chadwick 2002; Glasson 2009). The uncertain status of such im- pacts, plus the lack of best-practice guidance on their assessment, has resulted in a partial approach in practice. When socio-economic impacts are included, there tends to still be a focus on the more measurable direct employment impacts. The con- sideration of the social-cultural impacts (such as severance, alienation, social polarization, crime and health) is often very marginal. Although there is now increasing momentum behind the assess- ment of health impacts, the important area of crime and safety has had a much lower profile. Glasson and Cozens (2011) provide an update on some key issues for advancing the better consid- eration of these topics in EIA practice including: the need to employ meaningful data, including 'fear of crime' considerations; the consideration of innovative approaches to the use of indicators;
and use of evidence and concepts from the field of environmental criminology.

However, the fuller and better consideration of socio-economic impacts docs raise issues and challenges, for example about the types of impact, their measurement, the role of public participation and their position in ElA. One categorization of socio-economic impacts is into: (a) quantitatively measurable impacts, such as population changes, and the effects on employment opportunities or on local financial implications of a proposed project, and (b) non-quantitatively measurable impacts, such as effects on social relationships, psychological attitudes, community cohesion, cultural life or social structures (CEPA 1994). Such impacts are wide-ranging; many are not easily measured, and direct communication with people about their perceptions of socio-economic impacts is often the only method of documenting such impacts. There is an important symbiotic relation- ship between developing public participation approaches and the fuller inclusion of socio- economic impacts. SIA can establish the baseline of groups that can provide the framework for public participation to further identify issues associated with a development proposal. Such issues may be more local, subjective, informal and judgemental than those normally covered in EIA, but they cannot be ignored. Perceptions of the impacts of a project and the distribution of those impacts often largely determine the positions taken by various groups on a given project and any associated controversy.

provide an opportunity

- Workplaces
-

Advice

- Leisure facilities
- Health services
- Police
- Transport
- Public works
- Banking
- Local community

facilities and organizations

- Emergency services
- Schools

Family structure and relationships Housing conditions

- Employment status
- Working conditions Income
- Education

- Increasing public transport use1 walking,

Social Environment

Sustainability

_/

Community Services

Lifestyle

Economic Environment

People and Community Well-being

- Supporting local business
- Business activity Job creation
- Distribution of income
- Availability of training

/
Transport

The Natural Environment

- Access
- Congestion
- Private vs. public
- Alternatives

- Vibration
- Air, water, soil quality
- Noise, odour, dust, light
- Natural resources
- Green space
- Waste disposal/ management

- Community structure
- Social contacts
- Community • Disturbance of ecosystems or natural environments
- Support for local businesses Effect on future generations
- Recreation choices

- Access to and use of leisure facilities
- Access to nutritional food

cycling and non-car dependent modes of transport
Exercise patterns
Risk behaviours
participation

- Crime and antisocial behaviour
- Discrimination
- Safe environments
- Social networks
- Feelings of trust
- Feelings of power and control over life decisions

Figure 12.2

Some of the many environmental determinants of health outcomes
Source: Western Australia Department of Health 2007

and negative health oucomes, as exemplified in Figure 12.2 from a very useful Western Australian publication on HIA (Western Australia Department of Health 2007). Health impact refers to a change in the existing health status of a population within a defined geographical area over a specified period of time. HIA is a combination of procedures and methods by which a policy, plan, programme or project may be judged as to the effects it may have on the health of a population. It provides a useful, tlexible approach to helping those developing and delivering proposals to consider their potential (and actual) impacts on people's health, and on health inequalities, and to improve and enhance a proposal (Taylor and Quigley 2002; Taylor and Blair-Stevens 2002; WHO Regional Office for Europe 2003; Douglas 2003).

HIA is well advanced in a number of developed countries, particularly Canada, the Netherlands, in parts of Scandinavia, and more recently in Australia and the UK. Some developing countries are also finding it very relevant to their needs (see Phool- charcon et al. 2003, for Thailand). Policy drivers can be found at various levels of government. In the UK, for example, see the Department of Health and the Association of Public Health Observatories websites. In the EU, the Directive on SEA specific- ally and very usefully refers to the impact of plans and programmes on human health (see Box 11.1). The main stages in the J-JIA process are very similar to those used in EIA, including: screening, scoping, profiling (identifying the current health status of people within the defined spatial boun- daries of the project using existing health indicators and population data), assessment (HIA stresses the importance of consultation with community groups to identify potential impacts), imple- mentation and decision-making, and monitoring and continual review (Douglas 2003). There are now also many useful national guides; for example, for Ireland (JPHI 2009) and for Western Australia as previously noted. Appendix 6 provides further UK and international website gateways into the burgeoning HIA field.

The overlap between HIA and EIA in terms of process, and in terms of many categories of baseline data (Figure 12.2 indicates the potential wide coverage of HIA) does raise questions as to why HIA and EIA are not better integrated. Ahmad (2004) suggests an interesting list of reasons for this, including the difficulty of establishing causality between population health and multiple pollutants; limitations on resources to carry out such assessments within the often tight timcframcs of EIA; confidentiality of some health data; lack of mandatory legal framework requiring HlA; and bias among EIA professionals towards engineer- ing and ecology backgrounds. However, he also concludes that there are many benefits to be gained from closer integration, in terms of shared experi- ence, procedures, data and values. With regard to the last, HIA can bring to EIA 'values such as equity, transparent use of evidence and the con- sideration of differential impacts of the policy or project on various population subgroups' (Ahmad 2004). The SEA Directive 2001/42/EC provides an important milestone on the desirable path to a more integrated approach - a concept that is developed a little further in Section 12.4.8.

and negative health oucomes, as exemplified in
Figure
impact assessment (EqlA). An early step was gender impact assessment; this received international prominence through the World Conference on Women at Beijing, which in 1995 called on govern- ments to 'mainstream a gender perspective into all policies and programmes so that, before decisions are taken an analysis is made of the effects on women and men respectively.' This requirement was then built into the Treaty of Amsterdam, Articles 2 and 3, 1997. In the UK EqIAs were intro- duced first in Northern Ireland where legislation had made it unlawful to discriminate on the grounds of religious belief or political opinion. Disability equality requirements followed and since 2010, the Equality Act has provided the under- pinning legal framework in the UK.
EqlA is about considering how projects, plans, programmes and policies may impact, either posi- tively or negatively, on different sectors of the population in different ways. The key sectors typic- ally considered include age, gender, race/ethnicity (including gypsies and travellers), religion, dis- ability and sexual orientation, although other dimensions could include rural vs. urban, poor vs. rich, or people with vs. without access to cars. The steps in the process are also very similar to those used in EIA, and again there might be merit in the integration of the approach into the wider EIA process. It is important to identify the base- line equality characteristics and needs of the population likely to be affected by the development proposal. For example: is the workforce skewed towards male and young employees? Are some ethnic groups substantially under-represented in the workforce? Are various socio-economic issues concentrated in certain wards of particular towns? In England some of the spatial inequalities can be identified in some detail by using information from the Index of Multiple Deprivation (lMD 2011); relative levels of deprivation (for local authority areas, down to ward level) can be assessed by their rank position relative to all other English local authority areas; and regular updating of the IMD provides valuable trend data. The potential impacts of a proposed development on the baseline can be assessed and mitigation and enhance- ment measures can be introduced to hopefully improve the equality outcomes. Table 12.3 provides a summary example of equalities impacts in an EqlA that accompanied an ES for a large mixed-
use redevelopment of nearly 5000 homes of mixed tenure, along with associated health, community, leisure, education and retail facilities in inner London (Scott Wilson 2006).

Appropriate assessment is a Europe-specific form of assessment that tests the impacts of a project or plan on the integrity of internationally important nature conservation sites: Special Protection Areas for birds, and Special Areas of Conservation for habitats and species.1 Appropriate assessment is required through Articles 6.3 and 6.4 of the Habitats Directive:

step

Table 12.3 Illustration of EqlA impacts

Issue	Affected group	Impact
(a) Summary of significant adverse impacts affecting specific equalities groups		
Health		

Community cohesion

Community facilities Well-being

Well-being

Mental health sufferers, including among BME population
BME groups, women, including lone parents, children, gay and lesbian people

BME groups, particularly Turkish community Older women

Disabled people

Temporary increase in stress as result oi demolition and redevelopment
Temporary or permanent disruption of existing social networks, increased isolation as result of rehousing/redevelopment
Permanent loss of facilities for social gatherings

Temporary or permanent loneliness, isolation as result of decant process
Temporary risk of individual needs being overlooked during decant and redevelopment process
Well-being Older people

Well-being Children

Leisure and open spaces Children and young people and well-being

Leisure and open spaces Children and young people
Temporary/permanent stress, disruption, anxiety increased as result of change, including change to established routine
Temporary/long-term disruption to living environment during childhood as a result of living on major redevelopment
Possible permanent impact of private courtyards actively excluding casual use by older children including teenagers - both on their well-being and courtyard cohesion
Temporary loss of access to open spaces, hang-outs in public spaces, play areas during construction
(b)
Summary of significant beneficial impacts affecting specific equalities groups (housing, employment and skills only)

Housing BME households

Women/ single parent households Disabled people
Older people

Children

All groups

Improved housing quality Reduced overcrowding
New homes for young people
Increased home ownership levels in affordable housing More appropriate housing for young children
More accessible homes lo enable independent living

Improved insulation and heating for warmer homes Lifetime homes support independent living
Reduced overcrowding
More generous bedroom and storage provision for children in social rented sector
More storage, less accidents around home

Employment and skills

BME

Women Women

Target group for construction employment opportunities Targeted skills training
Children's centre facilitates women to seek employment

Target group for construction employment Targeted skills training

Source: Scott Wilson (2006)

if it will have no signihcant impact on site integrity or if other very tough tests are passed). Appropriate assessment is called 'appropriate' because the level of detail of the assessment, and when the assess- ment can stop, depends on the project/plan and relevant SPA/SACs. The European Commission (2000) has published guidance that explains how appropriate assessment can be carried out in up to four steps, with the findings of each step deter- mining whether the next step is needed:

Screening: Determine whether the plan, 'in combination' with other plans and projects, is likely to have a significant adverse impact on a European site.

- Appropriate assessment: Determine the impact on the integrity of the European site of the plan, 'in combination' with other projects or plans, with respect to the site's structure, function and conservation objectives. Where there are adverse impacts, assess the potential mitigation of those impacts. Where there aren't, then the plan can proceed as it is.
- Assessment o(alternatives solutions: Where the plan is assessed as having an adverse effect (or risk of this) on the integrity of a European site, examine alternative ways of achieving the plan objectives that avoid adverse impacts on the integrity of the European site.
- Assessment where no altemative sol11tio11s remain and where adverse impacts remain: Assess compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest, it is deemed that the plan should proceed.

12.4.6 Climate change and EIA

A high-profile example of appropriate assess- ment was the extension to Rotterdam Harbour. The project would significantly affect about 3,000 hectares of marine and natterjack toad habitats, but there were no alternatives and it would create roughly 10,000 long-term jobs. The project was given permission on condition that compensation was provided in the form of a new marine reserve, 25,000 hectares of protected area, and new dunes. A contrasting case was a proposed container terminal (port) at Dibden Bay in southern England, which would have affected the integrity of the Solent and Southampton Water SPA. This proposal was refused on appropriate assessment grounds
because alternatives were available in the form of other UK ports that could provide enough container capacity.

Climate change presents a fundamental challenge for all countries worldwide. EIA (and SEA) would seem directly relevant and very appropriate as tools: to assess the impacts of development actions on climate change, and climate change impacts on those development actions, and to advance appropriate mitigation and adaptation measures. Annex IV of the EU EIA Directive does identify the following in the important information to be supplied by the developer:

3. A description of the aspects of the envir- onment likely to be significantly affected by the propsed project, including in partic- ular, population, fauna, flora, soil, water, air, climatic factors, material assets ... and the inter-relationships between the above factors. (author emphasis)

Further, the UK government (DCLG 2007) noted that 'LPAs should not require specific and standalone assessments (of climate change) where the requisite information can be provided through
. .. environmental impact assessments'. In 2009, a survey of Eli\ practitioners by the UK Institute of Environmental Assessment and Management (IEMA 2010a) found that 88 per cent felt that, where relevant, carbon emissions should be con- sidered in the EIA and reported in the ES. Yet recent practice suggests that EIA is not ful- filling its potential with regard to climate change. While the EIA Directive does mention climatic factors, the 2009 review of the EU EIA Directive (CEC 2009) notes that climate change issues are not expressly addressed in the Directive and that Member States recognize that they are not adequately identified and assessed within EIA practice. Wilson and Piper (2010) note similar experience from Canada, where a report by the Canadian Environmental Assessment Agency (CEEA 2003) found that climate change had not been well covered in most EAs. They suggest a number of reasons for this limited take-up includ- ing, for example, the often shorter term time

Table 12.4 IEMA principles for EIA mitigation of GHG emissions

Overarching principles

- The GHG emissions from all projects will contribute to climate change; 1he largest inter-related cumulative environmental effect.

- The consequences of a changing climate have the pctential to lead 1o significan1 environmental effects on all topics in the EIA

Directive - e.g. population, fauna, soil, etc.

- The UK has legally binding GHG reduction targets; EIA must therefore give due consideration to how a projed will contribute to the achievement of these targets.

- GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit; as such any

GHG emissions or reductions from a projecf might be considered to be significant.

- The EIA process should, at an early stage, influence the design and location of projects to optimise GHG performance and limit likely contributions to GHG emissions.

More specific assessment principles

- During scoping, climate change and mitigation issues and oppcrtunities should be considered alongside each other to ensure integration in project design.
- The scope of GHG emissions must consider the relevant policy framework (local to global) and should also review 1he relevant findings in any associated SA/SEA
- When assessing alternatives, consideration of the relative GHG emissions performance of each option should be considered alongside a range of environmental criteria.
- Baseline considerations rela1ed to GHG emissions should refer to the policy framework and also include the current si1uation and, where possible, take accounf of the likely future baseline situation.
- Quantification of GHG emissions (e.g. carbon calculators) will not always be necessary within EIA; however where qualitative assessment is used (e.g. emissions trends related 1o construction practices) it must be robust, 1ransparent and jus1i able.
- The assessment should aim to consider whole life effects (e.g. embodied energy, and emissions related to cons1ruction, operation and decommissioning - as relevant).
- The significance of a projects's emissions should be based on its net GHG effects, which may be positive (reduced) or negative (additional).
- Where GHG emissions cannot be avoided, the EIA should aim to reduce the residual significance of a projed's emissions at all stages - design, construdion, operation, etc.
- Where GHG emissions remain significant, but cannot be reduced further, approaches to compensate the project's remaining emissions should be considered.

Source: IEMA (2010a)

12.4.7 Resilience thinking

horizons of EIA compared with climate change, difficulties in dealing with climate change uncer- tainty, some fragmentation of EIA (as noted in Chapter 1 of this book) and the difficulty of address- ing interrelationships of factors (CEC 2009).
So what might be the way forward for EIA and climate change? The IEMA (2010a, b) has produced assessment principles relating to both climate change mitigation and adaptation; Table 12.4 sets out some over-arching principles, and more specific EIA assessment principles.

Project planning typically assumes that future changes will be gradual and predictable, whereas in reality they often come as sharp, unforeseen shocks: floods, volcanic eruptions, pandemics, eco- nomic crises, power outages etc. Resilience thinking is about how to deal with such shocks not by setting up systems to protect people and develop- men ts against all negative future change (as in risk assessment), but rather by making them able to cope with the shocks when they do come. It is the equivalent of teaching a child safe cycling and assertiveness rather than keeping them home from school for fear of accidents and bullying.

Some quite subtle and complex principles underlie resilience thinking, which can only be briefly summarized here. First is the inevitability of change, and the concept of adaptive cycles. All socio-economic systems go through an initial period of slow growth and accumulation, be it the formation of a woodland or a community group.

This is typically followed by a short sharp period of decline, precipitated by a shock, say a woodland fire or the death of a key member of the com- munity group. Depending on the system's resili- ence, the end result can be a reorganization into an equally 'good' new state - say, a new young woodland - or a worse state like a charred unpro- ductive field or the disbanding of the community group. The phase of decline might be delayed, for instance by putting out forest fires, but this simply delays and escalates the impacts of the change when it does occur.

The second is the importance of thresholds or tipping points. Socio-environmental systems have a certain ability to recover from impacts, but if they are tipped over a threshold, then they plunge into a new state, which is normally disproportionately hard to recover from. for instance, it is much harder to return a eutrophic lake to a healthy state than to prevent a healthy lake from becoming eutrophic.

Third is the importance of 'slow variables' like climate, soil, global economic systems, or social networks. These systems act as buffers and reser- voirs for the regeneration of smaller, faster systems such as habitats, species, communities and individuals. However, when the slow variables themselves are worn away (e.g. through a drop-feed of greenhouse gases or soil erosion) then this buffer and regeneration function is also worn down.

What does this mean for the planning of major projects? Some types of development - both the types of projects and how they arc designed and implemented - are more resilient than others. Resilient projects would:

Embrace variability rather than control it. Instead of increased tlood defences, 'just in time' pro- duction and air conditioning, this would involve designing projects to cope with floods, having industrial processes that can cope with delayed parts, and having windows that open in offices and on public transport.

Build in redundancy or duplicatio11, so that if one aspect fails the other one can take over. The Deepwater Horizon oil spill would have been a minor blip for BP if the oil platform had had a back-up blow-out preventer. Providing access to a development by both road and rail, and putting emergency gates in the central reservation of major roads to allow cars to turn around, allows flexibility in case of accidents, flooding or congestion. Housing develop- ments with 'spare' land can convert this to food production or temporary shelter if necessary.

Maintain some modularity or disco1111ected11ess, since over-connected systems are susceptible to shocks and transmit them rapidly. In the Middle Ages, villages would shut themselves off during times of plague. Modern equivalents are dykes, bunds, security barriers/gates and other access controls.

Recognize the importance of slow variables. This would mean giving greater weight in project planning and planning decisions to things like loss of high-quality agricultural land, water cycles, emissions of greenhouse gases, loss of customs and languages, and resettlement of communities.

Create t('ihter feedback loops between '1111111111 actions and environmental outcomes. Many of our impacts occur away from us: in other coun- tries where our food is grown and our clothes are manufactured, or in other parts of the UK where our energy is produced and waste disposed. Examples of this approach include greater emphasis on local rather than centralized production (e.g. energy, water, food), the proximity principle in siting waste disposal projects, and community develop- ment and ownership of infrastructure projects.

Promote and sustain diversity i11 all forms (e11viro11- 111ental, social and economic). This principle runs counter to the common approach to decision-making, which promotes efficiency, targets and guarantees, but it is diversity that allows different responses to shocks and provides a source of future options. Examples include protecting areas of ecological diver- sity, promoting pilot projects for new tech- nologies (e.g. various forms of tidal energy or carbon storage), and protecting indigenous people's lifestyles (adapted from Walker and Salt 2006).

Table 12.5 shows how the results of resilience assessment might differ from the results of

traditional project planning.
Table 12.5 Contrasting resilience and traditional project planning approaches

Scenario Results of traditional
project planning
Results of resilience thinking Source on which this
example was based

A very small-scale (three person) biodiesel producer in Barbados helps to reduce waste going to landfill and provides 'indigenous' fuel, but competes with others for limited waste cooking oil as fuel, and production costs are high due to the small scale nature of the operation

Two small villages in Tajikistan are facing water shortages due to ageing infrastructure and increasing population of humans and livestock
Increase the size of the operation, mechanize it, improve its efficiency

Build a new reservoir
Develop a co-operative of
small-scale b,odiesel producers; develop biodiesel as a tourism project that provides tourism income as well as money from selling the diesel

Train local people to repair and maintain the existing water infrastructure, improve family planning, regulate water use through quotas and rules
Gadreau and Gibson
(2010)

Fabricius et al. (2009)

Increasing number of 'muddy floods' from Improve flood defences agricultural run-off in England and Belgium
cause millions of euros of damage each year

Improve 'institutional memory': Boardman and value and maintain historical Vandaele (2010)
understanding o1 factors leading
to these floods and how to manage the floods

The Resilience Alliance has also developed a resilience assessment framework (RA 2010). This differs from EIA in that, inter alia, it places greater emphasis on uncertainty and disruptions (both past and future), considers higher scale actions and events that could affect the project scale, identifies thresholds of change and alternate states that could result from exceeding these thresholds, and focuses explicitly on the governance systems that manage changes. We are not aware of any cases where resilience assessment and EIA have been integrated, but clearly resilience assessment has the potential to strengthen EIA and make EIA projects better able to cope with future change, and we expect resilience thinking to be increasingly integrated into

EIA.

As noted at the beginning of the book (Section 1.5.3), there has been an explosion of terms in relation to environmental assessment. One of these is that of integrated environmental assessment, which can relate to both environmental themes and techniques. In terms of themes, the preced-
ing discussion of widening of scope to include more clearly socio-economic, health, equality and resilience content, can lead to a more integrated impact assessment (IIA), with decisions based partly on the extent to which various biophysical, social and economic impacts can be traded (Figure 12.3). For example, decision-makers might be unwilling to trade critical biophysical assets (e.g. a main river system and the quality of water supply) for jobs or lifestyle, but willing to trade less critical biophysical assets. Integrated impact assessment differs from traditional EIA in that it is consciously multi-disciplinary, does not take citizens' partici- pation or the ultimate users of EIA for granted and recognizes the critical role of complexity and uncertainty in most decisions about the environ- ment (Bailey et al. 1996; Davis 1996). Hence it tolerates a much broader array of methods and perspectives (quantitative and qualitative, eco- nomic and sociological, computer modelling and oral testimony) for evaluating and judging alternative courses of action. However, integration is not without its problems, including limitations on the transferability of assessment methods (see Projea Appraisal 1996). The Integrated Assessment

Severe biophysical impacts

Figure 12.3

Integrated impact assessment

Workshop at the IAIA 2002 Conference highlighted the continuing problems of including social processes in integrated assessment ()AJA 2002).

Another equally important perspective is of the integration of relevant planning, environmental protection and pollution procedures. At the one extreme the UK still has multiple regulations for EIA, grafting the procedures into an array of relevant planning and other legislation; there is also parallel environmental protection and pol- lution legislation. At the other, there is the New Zealand 'one-stop shop' Re.source Management Act. A better integration of relevant procedures repre- sents another challenge for most EIA systems.

An important and positive trend in EIA has been its application at increasingly early stages of project planning. For instance, while the DoT's 1983 Manual of enviro11111e11tal appraisal applied only to detailed route options, its later Design manual for roads a11d bridges requires a staged approach covering, in turn, broadly defined route corridors,
route options and the chosen route (Highways Agency 2011). National Grid also uses multiple levels of environmental analysis for its transmission lines, from broad feasibility studies to detailed design (National Grid 20xx). This application of EIA to the early stages of project planning helps to improve project design and to avoid the delayed and costly identification of environmental con- straints that comes from carrying out EIA once the project design is completed.

McDonald and Brown (1995) suggest that the project designer must be made part of the ElA team:

Currently, most formal administrative and reporting requirements for EIA are based on its original role as a stand alone report carried out distinct from, but in parallel with the project design ... We can redress [EIA limita- tions] by transferring much of the philos- ophy, the insights and techniques which we currently use in environmental assessments, directly into planning and design activities.

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Figure 12.4

Art and development projec1 combined: the Hundertwasser/Spittelau incinerator in Vienna

Source: Wikimedia Commons

before the design process is begun, but then allow designers freedom to design innovative and attrac- tive structures as long as they meet those con- straints. Figure 12.4 is an example of this approach: the magnificent Hundertwasser incinerator in Vienna, an incinerator that people might actually want to have in their city.

Holstein (1996) calls this postmodern approach 'environmental impact design' (EID), and distin- guishes it from EIA's traditionally conservative, conservation-based focus.2 The following para- graphs explain Holstein's view of EID.

EIA as presently practised deconstructs a site: it takes an environment apart to highlight the different interacting components within it (e.g. soil, water, flora). EIA suggests that the site has another (environmental) function other than that for which it is being develo- ped. Yet this relationship to deconstruction is only superficial because EIA is conservation based; it makes little challenge to the fixed hierarchies of modernism that underpin it, such as development-induced growth and technological subservience. Environmental design within EIA is too often merely a by- product of assessment or is even handed back to the developer to have another shot at the design themselves. It makes little use of artistic-based metaphors to provide any re-enchantment or return to human land- scape values, it makes no attempt to rip apart environmental function and form, and creates no demand for the kind of relative individualism needed to reflect cultural sus- tainability to an u n interested-unless-aroused population (all characteristics of postmod- ernism). Through this passivity of EIA, time, space, communication, leadership - all the key elements of good flowing design are lost.

This said, initially it might be argued that true postmodernism is simply beyond the remit of an ElA that exists for objective assessment rather than artistic purposes. The above description should be called EID. EID emphasizes the artistic contribution

DIMENSIONS PERSPECTIVES

Ecological systems
flora fauna water
81(

Visitors' satisfaction
volume behaviour service levels
/-------------;- hospitality

land / ' .,,.,.".,. \ \ expectations

1

Physical structure
'
I I ----- I

Community tolerance
water supply land supply energy supply transport; parking visitors' amenities accommodation
;I ....-r- I
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,,.I
privacy; access involvement quality of life beneficiaries tourists' behaviour

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I
12.4.10
0 Complementary changes: enhancing skills and knowledge 12.5
Extending EIA to project implementation: environmental management systems, audits and plans

Economic

,

Political

cost of living
\I ;
_,,.
/
goals

tourist spending
investment labour costs technology
"
----
capability priorities jurisdictions policies

Figure 12.5

Carrying capacity: a tourism example

Source: Giasson el al. 1995

to EIA; it requires a different set of approaches (and probably personnel) than pure EIA, as well as creativity and elements of cultural vision. To an extent, some of the principles of EID arc already being undertaken in EIA, in the mitigation sections of EISs, and especially within environmental div- isions of the larger developers (e.g. the utilities) who often seem to see the formal EIA process as merely a lateral extension to their own design policies. Even so, rarely is it recognized as an artistic activity. The key difference between EIA and EID lies in the concept of 'unmodifiable design'. Traditionally, EIAs are carried out on projects in which most of the structural clements have already been finalized. In more EID-oriented approaches, there is less unmodifiable design, and thus more scope for introducing environmentally sound design as mitigation measures. An even more radical path would be a postmodern EIA which aims to begin with so few unmodifiable design ideas that the EIA essentially becomes the leading player in design (adapted from Holstein 1996).

The previous discussions indicate that EIA practi- tioners need to develop further their substantive knowledge of the wider environment. There is also an important role for 'State of the environ- ment reports' and the development of 'carrying capacity and sustainability indicators' - if not interpreted too narrowly. Carrying capacity is multi-dimensional and multi-perspective (see Figure 12.5 for an example for tourism impact assessment). Carrying capacity is also an elastic concept, and the capacity can be increased through good management. Practitioners also need to develop both 'tech- nical' and 'participatory' approaches, using, for example, focus group, Delphi and mediation approaches. EIA has been too long dominated by the 'clinical expert' with the detached quantitative analysis. However, there is still a place for the sensible use of the rapidly developing technology
- including expert systems and GIS (Rodriguez- Bachiller with Glasson 2004). There is also a need for more capacity building of EIA expertise, plus relevant research, including, for example,
more comparative studies and longitudinal studies (following impacts over a longer life cycle - moving towards adaptive EIA).

An environmental management system (EMS), like EIA, is a tool that helps organizations to take more responsibility for their actions, by determining their aims, putting them into practice and moni- toring whether they are being achieved. I lowever, in contrast with the orientation of EIA to future development actions, EMS involves the review, assessment and incremental improvement of an existing organization's environmental effects. EMS can thus be seen as a continuation of EIA principles into the implementation stage of a project. In essence, EMS and EIA can be seen as environmental protection tools with complementary purposes, with ElA seeking to anticipate and mitigate/ enhance impacts of proposed new projects at the planning and design stage, and EMS helping organ- izations to effectively manage the day to day impacts during the full life cycle of such projects (Palframan 2010).

EMS has evolved from environmental audits,
which were first carried out in the 1970s by private firms in the USA for financial and legal reasons as an extension of financial audits. Auditing later spread to private firms in Europe as well and, in the late 1980s, to local authorities in response to public pressure to be 'green'. In the early 1990s environmental auditing was strengthened and expanded to encompass a total quality approach to organizations' operations through EMS. EMS is now seen as good practice and has mostly sub- sumed environmental auditing.

This section reviews existing standards on EMS, briefly discusses the application of EMS and environmental auditing by both private companies and local authorities, and concludes by considering the links between EMS and EIA, using environ- mental management plans (EMPs) and other vehicles.

EMS

Three EMS standards apply in the UK: the EC's Eco- Management and Audit Scheme (EMAS) of 1993, which was revised in 2001; the International Organization for Standardization's (ISO) series 14000; and the more recent British Standard (BS) 8555. The schemes are compatible with each another, but differ slightly in their requirements. The EC's EMAS scheme was adopted by EC Regulation 1836/93 in July 1993 (EC 1993), and became operational in April 1995. It was originally restricted to companies in industrial sectors, but since the 1993 regulations were replaced in 2001 by Regulation 761/2001 (EC 2001a) it has been open to all economic sectors, including public and private services. It was most recently updated in 2009/10 by Regulation 1221/2009, which came into force in January 2010. It is a voluntary scheme and can apply on a site-by-site basis. To receive
EMAS registration, an organization must:

- Establish an environmental policy agreed by top management, which includes provisions for compliance with environmental regulation, and a commitment to continual improvement of environmental performance.

- Conduct an environmental review that con-

siders the environmental impacts of the organ- ization's activities, products and services; its framework of environmental legislation; and its existing environmental management prac- tices.

- Establish an EMS in the light of the results of the environmental review that aims to achieve the environmental policy. This must include an explanation of responsibilities, objectives, means, operational procedures, training needs, monitoring and communication systems.

- Carry out an environmental audit that assesses

the EMS in place, conformity with the organ- ization's policy and programme and compli- ance with relevant environmental legislation.

- Provide a statement of its environmental per-

12.5.2
Implementation of EMS and environmental auditing 12.5.3
Links between EMS and EIA

formance that details the results achieved against the environmental objectives, and steps proposed to continuously improve the organization's environmental performance. (EC 2001b)

The environmental review, EMS, audit pro- cedure and environmental statement (ES) must be approved by an accredited eco management and audit scheme (EMAS) verifier. The validated state- ment must be sent to the EMAS competent body for registration and made publicly available before an organization can use the EMAS logo. In the UK the competent body is the IEMA. Although EMAS was originally oriented towards larger private organizations, it can also apply to local authorities and smaller companies.

The T11temational Organization for Standardiw- tion's ISO 14000 series was first discussed in I 991,

Table 12.6 Differences between EMAS and IS014001

EMAS ISO 14001

Preliminary environmental review Verified initial review No review

External communication and verification Environmen1al policy, objectives, EMS
and details of organization's performance made public
Audits Frequency and methodology of audits of

Environmental policy made public

Audits of the EMS (frequency of methodology
the EMS and of environmental performance not specified)

Contractors and suppliers

Required influence over contractors and suppliers

Relevant procedures are communica1ed to contractors and suppliers
Commitments and requirements
Employee involvement, continuous Commitment of con1inual improvement of the improvement of environmental performance EMS rather 1han a demonstra1,on of continual and compliance wi1h environmental legislation improvement of environmental performance

and a comprehensive set of EMS standards was published in September 1996. These include ISO 14001 on EMS specifications (ISO 1996a), ISO 14004 on general EMS guidance (ISO 1996b) and ISO 14010-14014, which give guidance on envir- onmental auditing and review. EMAS and ISO 14001 are compatible, but have some differences. These are shown in Table 12.6.

In 2003 the UK government introduced a new EMS initiative - BS 8555 (Guide to the imple111e11-te1tio11 o(,111 e11viro11me11tal management system i11d11cli11g e11viro11me11te1I per(onncmce ev11l11e1tio11) - to assist organizations, in particular small and med- ium sized enterprises, to implement an environ- mental management system and subsequently achieve EMAS registration (DEFRA 2003). The standard includes guidance on how to develop indicators, so right from the start it is possible to know whether environmental impacts have been successfully reduced. The !EMA Acorn Scheme provides an officially recognized EMS standard recommended by the government. Acorn provides a route to EMS implementation, broken down into a series of logical, convenient, manageable phases using the British Standard BS 8555, plus a clearly defined route plan to ISO 14001 certification and/or EMAS registration.

By 2010, more than 130,000 organizations world- wide had gained ISO 14001 certification, with over 10,000 in the UK. In addition in the UK over 1SO organizations have achieved the BS8SSS and !EMA Acorn scheme, and another 500 are working through the scheme. Europewide, 4,500 organiza-tions have participated in EMAS, with over 70 of these in the UK. Organizations perceive EMS as a way to reduce their costs through good manage- ment practices such as waste reduction and energy efficiency. They also see EMS as good publicity and, less directly, as a way of boosting employees' morale. However, private companies still have problems implementing EMS due to commercial confidentiality, legal liability, cost and lack of commitment. Smaller companies are especially affected by the cost implications of establishing EMS systems, and have been slower than the larger companies in applying it to their operations. The use of EMS by local authorities has been limited by cutbacks in central government funding, government reorganization and growing public concerns about economic rather than environ- mental issues.

Environmental information

The growth in EMS is important to EIA for several reasons. First, EMS of both public sector and private sector organizations will increasingly generate environmental information that will also be useful when carrying out EIAs. For example, local authorities' State of the Environment Reports provide data on environmental conditions in areas that can be used in EIA baseline studies. Generally, such reports will contain information on such topics as local air and water quality, noise, land use, landscape, wildlife habitats and transport.

In contrast, private companies' environmental audit findings have traditionally been kept con-fidential, and it is noticeable from Section 12.5.2 that many more companies have opted for ISO 14001 accreditation - which requires only limited disclosure of information - than EMAS accredi-tation. Thus a private company's EMS is likely to be useful for EIA only if that company intends to open a similar facility elsewhere. However, environ- mental auditing information about levels of wastes and emissions produced by different types of industrial processes, the types of pollution abate- ment equipment and operating procedures used to minimize these by-products, and the effective- ness of the equipment and operating procedures will be useful for determining the impact of sim- ilar future developments and mitigation meas- ures. Some of these audits are also likely to provide models of 'best practice', which other firms can aspire to in their existing and future facilities. Most interestingly, however, project E!As are increasingly used as a starting point for their projects' EMSs. for instance, emission limits stated in an EIA can be used as objectives in the company's EMS, once it is operational. The EMS can also test whether the mitigation measures discussed in the EIA have been installed and whether they work effectively in practice. Overall, EMS is likely to increase the level of environmental monitoring, environmental

Contractor EMS

Pre-decision Consent/Decision

Project preparation including EIA (where

Post-decision including detailed design and construction mitigation management

.

Project operational

.
necessary) and identification of mitigation/ enhancement
Application for consent and ES

,If

EMP

EMS

PREPARATION AND IMPLEMENTATION OF EMP

Client/Proponent EMS

Figure 12.6

Linkages between EIA, EMPs and EMS Source: IEMA 2008

Table 12.7 Benefits of preparing an EMP

	Creates a framework for ensuring and demonstrating conformance with legislative requirements, conditions and mitigation set out in ESs.
2	Provide a continuous link or 'bridge' between the design phase of a project and the construction, and possibly operational, phase.
3	Ensures an effective communication or feedback system is in place between the operators on site, the contractor, the environmental manager (or consultant) and ultimately the regulator.
4	Preparing a draft EMP at an early stage demonstrates commitment to mitigation and can help reduce delays post-consent by showing how consultees and consenting authority concerns will be addressed.
5	Drives cost savings through improved environmental risk management.

Source: Adapted from IEMA 2008, 2011

awareness and the availability of environmental data; all of this can only be of help in EIA.

Environmental Management Plans

A very practical link between EIAs and EMSs can be provided by environmental management plans (EMPs) - to add yet another acronym! The aim of EMPs is to ensure that the effort put into the EIA process pre-application and consent is effec- tively delivered post-consent. This may involve overcoming a variety of perceived barriers linking EIA and EMS, including different consenting regimes, time periods and personnel, and lack of resources (Palframan 2010). Recent experience of EMPs has been of a less formal, simpler, less bureaucratic, and 'EMS-lite' approach (Marshall 2004). The IEMA has been a strong UK advocate of the EMI' approach, and set out its position in its practitioner guide on Environmental Management Plans (!EMA 2008). An EMP is a document that: sets out the actions that are needed to manage environmental and community risks associated with the life cycle of a development, identifies what is needed, when, and who is responsible for its delivery. It is a bridge between the EIA process pre-consent and EMS operated by various stake- holders (e.g. project construction contractors,

Table 12.B The building blocks for developing a successful EMP

Involvement of the proponent, construction teams and contractors during the formulation of mrtigation when planning the development to ensure:
the mitigation is deliverable:
costs of mitigation actions are factored into the detailed design stage, while the construction budget is still being developed; and
there is buy-in and commitment when developing mitigation at the EIA stage, to increase likelihood of effective implementation.

2 Involvement of competent environmental professionals in the design and specification of mitigation actions to ensure: that the requirements are very clear: and

to improve the chances of successful delivery.

3 Ensuring mitigation measures identified while planning the development have been formulated wrth the involvement of relevant stakeholders, or a clear timetable and process for further consultation post-consent is set out (where mitigation requires more detailed design post-consent).

4 Clearly identified and sufficiently detailed mitigation measures in the pre-consent phase (a framework or draft EMP prepared alongside an ES is helpful as it can set out additional detail in preparation for a full EMP).

5 Ensuring mitigation proposals are identifiable in documents accompanying the application for development consent;

6 Ensuring mitigation measures are presented as elements that the proponent would be willing to have included in the final consenting documentabon.

12.6 provides a simple illustration of this bridging role; Table 12.7 outline further reasons for using EMPs and the key building blocks for the approach. The !EMA believes that EMPs will become increasingly common in UK practice; a practitioner survey found that almost 80 per cent of respon- dents agreed that a draft EMP should be required within the EIS (!EMA 2011). However, the format and name may vary. For example, all E!Ss pro- duced by the Environment Agency for England and Wales include an environmental action plan (EAP). This acts as an interface between the EIA and the EMS and keeps the EIA as a 'live' document through the project life. Projects for other devel- opers have included Construction Environmental Management Plans (CEMl's) which focus on imple- mentation during the project construction stage; these are more limited, but are still valuable for this often very disruptive stage in a project's life

Source: Adapted from IEMA 2008, 2011

project operation managers) post-consent. Figure (Palframan 2010).

12.6 Summary

As in a number of other countries discussed in Chapter 10, the practice of EIA for projects in

the UK, set in the wider context of the EU, has progressed rapidly up the learning curve. Understandably, however, practice has highlighted problems as well as successes. The resolution of problems and future prospects are determined by the interaction between the various parties involved. In the EU the various amendments to the EIA Directive have helped to improve some steps in the EIA process, including screening, scoping, consideration of alternatives and participation. However, some key issues remain un- resolved, including the lack of support for mandatory monitoring. This chapter has identified an agenda for other possible changes, including cumulative impacts, socio-economic impacts and the linked areas of health impact and equalities impact assessment, appropriate assessment, resili- ence thinking, the key area of climate change, IIA and EID. Some of these will be easier to achieve than others, and there will no doubt be other emerging issues and developments in this dynamic area, and systems and procedures will continue to evolve in response to the environmental agenda and to our managerial and methodological capabilities.

There is also an urgent need to 'close the loop', to learn from experience. While the practice of mandatory monitoring is still patchy, notable
progress has been made in the development of environmental management and auditing systems. Assessment can be aided by the development of EMSs for existing organizations, be they private-sector firms or local authorities. The information from such activities, plus the recent and important development of £MPs as a bridge between EIA and EMS activity, pre- and post-consent, could provide a significant improvement in the quality and effective implementation of EIAs.

As EIA activity spreads, more groups will become involved. Capacity building and training is vital both in the ElA process, which may have some commonality across countries, and in procedures that may be more closely tailored to particular national contexts. EIA practitioners also need to develop their substantive knowledge of the wider environment and to improve both their tech- nical and participatory approaches in the EIA process.

SOME QUESTIONS

The following questiom are intended to help the reader focus 011 the important issues of' this chapter, and to start to comider potential approaches for improving the effectiveness of' project assessment.

1 Change is a feature of EIA systems; what is driving such change?

2 Which stakeholders are more positive about further developing EIA systems and which are less so, and why?

3 Review the features of 'best-case' EA performance identified by Sadler in 1996; do those features still all apply today? Would you add any new features?

4 Consider possible explanations as to why the assessment of cumulative impacts has been such a challenging task for EIA?

5 What do you understand by 'environmental justice'?

6 Identify the potential key socio-economic impacts of a new major project with which you arc familiar.

7 How might such impacts vary between the construction and operational stages of the project?

8 for the same project used in Question 6, consider the potential health impacts, again

considering how such impacts might vary between the construction and operational stages of the project?

9
Similarly, for the same project again, consider the potential equality impacts.

10
Examine the case for integrating health and equality impacts within a socio-economic impact assessment as part of a more integrated approach to EIA that includes both biophysical and socio-economic impacts.

11
When does appropriate assessment apply in the EU? What do you understand by the term 'imperative reasons of overriding public interest'? Why might they have been significant for the Rotterdam Harbour extension, but not for Dibden Bay on Southampton Water?

12
Why has climate change not been well covered in many E!As?

13
Review the specific climate assessment principles for EIA from !"able 11.4; consider which might be most difficult to achieve.

14
What kind of resilience 'features' could one integrate into the design of an urban housing development? A rural landfill site?

15
What do you understand by the term 'environmental impact design'?

16
What is an EMS? Outline some of the differences between the EMAS and ISO 14001 EMS systems.

17
Discuss the potential value of environmental management plans for more effective Eli\.

Notes

In practice, it is also applied 1o Ramsar wetland sites, candida1e SACs, and European Marine Sites.
2 This term was originally coined for a slightly different context by Turner (1995).

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Appendix 1

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Full text of the European Commission's EIA Directive (the Consolidated EIA Directive)

Council Directive of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (85/337/EEC)
Amended by:
Council Directive 97 /11 /EC of 3 March 1997;
Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003; and
Directive 2009/31 /EC of the European Parliament and of the Council of 23 April 2009.

Article 1

This Directive shall apply to the assessment of the environmental effects of those public and private projects that are likely to have significant effects on the environment.

2

For the purposes of this Directive: 'project' means:

the execution of construction works or of other installations or schemes;
other interventions in the natural surroundings and landscape including those involving the extraction of mineral resources;
'developer' means:
the applicant for authorization for a private project or the public authority that initiates a project;
'development consent' means:
the decision of the competent authority or authorities that entitles the developer to proceed with the project;
'public' means:
one or more natural or legal persons and, in accordance with national legislation and practice, their associations, organiza- tions or groups;
'public concerned' meam:
the public affected or likely to be affected by, or having an interest in, the environ- mental decision-making procedures referred to in Article 2(2); for the purposes of this definition, non-governmental organizations promoting environmental protection and meeting any requirements under national law shall be deemed to have an interest.

3

The competent authority or authorities shall be that or those that the Member States designate as responsible for performing the duties arising from this Directive.

4

Member States may decide, on a case-by-case basis if so provided under national law, not to apply this Directive to projects serving national defence purposes, if they deem that such application would have an adverse effect on these purposes.

5

This Directive shall not apply to projects the details of which are adopted by a specific act of national legislation, since the objectives of this Directive, including that of supplying information, are achieved through the legislative process.

Article 2

1

Member States shall adopt all measures necessary to ensure that, before consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects. These projects are defined in Article 4.

2

The environmental impact assessment may be integrated into the existing procedures for consent to projects in the Member States, or, failing this, into other procedures or into procedures to be established to comply with the aims of this Directive.

2(a) Member States may provide for a single procedure in order to fulfil the requirements of this Directive and the requirements of Council Directive 96/61/EC of 24 September
forms of assessment referred to in point (a), the information relating to the exemption decision and the reasons for granting it;

(c)

inform the Commission, prior to granting consent, of the reasons justifying the exemption granted, and provide it with the information made available, where applicable, to their own nationals.

The Commission shall immediately forward the documents received to the other Member States. The Commission shall report annually to the
Council on the application of this paragraph.

Article 3

The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11, the direct and indirect effects of a project on the following factors:

- human beings, fauna and flora;
- soil, water, air, climate and the landscape;
- material assets and the cultural heritage;
- the interaction between the factors mentioned in the first, second and third indents.

Article 4

Subject to Article 2 (3), projects listed in Annex I shall be made subject to an assessment in accordance with Articles 5 to 10.
1996 on integrated pollution prevention and 2 control.1
Without prejudice to Article 7, Member States may, in exceptional cases, exempt a specific project in whole or in part from the provisions laid down in this Directive.
In this event, the Member States shall:
(a)
consider whether another form of assessment would be appropriate;

(b)
make available to the public concerned the information obtained under other

Subject to Article 2 (3), for projects listed in Annex II, the Member States shall determine through:
(a)
a case-by-case examination, or

(b)
thresholds or criteria set by the Member State

whether the project shall be made subject to an assessment in accordance with Articles 5 to 10.
Member States may decide to apply both procedures referred to in (a) and (b).
3
When a case-by-case examination is carried out or thresholds or criteria are set for the

purpose of paragraph 2, the relevant selection 3 criteria set out in Annex III shall be taken into account.
4

Member States shall ensure that the deter- mination made by the competent authorities under paragraph 2 is made available to the public.

irrespective of whether the developer so requests.
The information to be provided by the developer in accordance with paragraph 1 shall include at least:
(a)
a description of the project comprising information on the site, design and size of the project;

(b)
a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects;

(c)
the data required to identify and assess (a)
the Member States consider that the information is relevant to a given stage of the consent procedure and to the specific characteristics of a particular project or type of project and of the environmental features likely to be affected;

(b)
the Member States consider that a developer may reasonably be required to compile this information having regard inter aliti to current knowledge and methods of assessment.

Article 5

In the case of projects that, pursuant to Article 4, must be subjected to an environmental impact assessment in accordance with Articles 5 to 10, Member States shall adopt the necessary measures to ensure that the developer supplies in an appropriate form the information specified in Annex IV inasmuch as:
the main effects that the project is likely to have on the environment,
(d)
an outline of the main alternatives studied by the developer and an indica- tion of the main reasons for his choice, taking into account the environmental effects;

(e)
a non-technical summary of the infor- mation mentioned in the previous indents.

4 Member States shall, if necessary, ensure that any authorities holding relevant information, with particular reference to Article 3, shall make this information available to the developer.

Article 6

Member States shall take the measures necessary to ensure that the authorities likely
2
Member States shall take the necessary measures to ensure that, if the developer so requests before submitting an application for development consent, the competent authority shall give an opinion on the inform- ation to be supplied by the developer in accordance with paragraph 1. The competent authority shall consult the developer and authorities referred to in Article 6 (1) before it gives its opinion. The fact that the authority has given an opinion under this paragraph shall not preclude it from subsequently requiring the developer to submit further (a)
the request for development consent;

(b)
the fact that the project is subject to an environmental impact assessment proce- dure and, where relevant, the fact that Article 7 applies;

(c)
details of the competent authorities responsible for taking the decision, those from which

relevant information can be obtained, those to which comments or questions can be submitted, and details of the time schedule for transmitting comments or questions;

(d)
the nature of possible decisions or, where there is one, the draft decision;

(e)
an indication of the availability of the information gathered pursuant to Article S;

(f)
an indication of the times and places where and means by which the relevant information will be made available;

(g)
details of the arrangements for public participation made pursuant to paragraph S of this Article.

(a)
any information gathered pursuant to Article S;

(b)
in accordance with national legislation, the main reports and advice issued to the competent authority or authorities at the time when the public concerned is informed in accordance with paragraph 2 of this Article;

(c)
in accordance with the provisions of Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environ- mental information,2 information other than that referred to in paragraph 2 of this Article that is relevant for the decision in accordance with Article 8 and that only becomes available after the time

information. 2
Member States may require the competent authorities to give such an opinion,
to be concerned by the project by reason of their specific environmental responsibilities are given an opportunity to express their opinion on the information supplied by the developer and on the request for development consent. To this end, Member States shall designate the authorities to be consulted, either in general terms or on a case-by-case basis. The information gathered pursuant to Article 5 shall be forwarded to those authorities. Detailed arrangements for con- sultation shall be laid down by the Member States.
The public shall be informed, whether by public notices or other appropriate means such as electronic media where available, of
the following matters early in the environ- 4 mental decision-making procedures referred to in Article 2 (2) and, at the latest, as soon as information can reasonably be provided:
The public concerned shall be given early and effective opportunities to participate in the environmental decision-making procedures referred to in Article 2 (2) and shall, for that purpose, be entitled to express comments and opinions when all options are open to the competent authority or authorities before the decision on the request for development consent is taken.
3
Member States shall ensure that, within reasonable time-frames, the following is made available to the public concerned:

S The detailed arrangements for informing the public (for example by bill posting within a certain radius or publication in local news- papers) and for consulting the public con- cerned (for example by written submis- sions or by way of a public inquiry) shall be determined by the Member States.
6 Reasonable time-frames for the different phases shall be provided, allowing sufficient time for informing the public and for the public concerned to prepare and participate effectively in environmental decision-making subject to the provisions of this Article.

Article 7

Where a Member State is aware that a project is likely to have significant effects on the environment in another Member State or where a Member State likely to be significantly affected so requests, the Member State in whose territory the project is intended to be carried out shall send to the affected Member State as soon as possible and no later than when informing its own public, inter alia:

(a) a description of the project, together with any available information on its possible transboundary impact;

(b) information on the nature of the decision that may be taken,

and shall give the other Member State a reasonable time in which to indicate whether it wishes to participate in the environmental decision-making procedures referred to in Article 2 (2), and may include the information referred to in paragraph 2 of this Article.

the public concerned was informed in 2
accordance with paragraph 2 of this Article.
If a Member State that receives information
pursuant to paragraph I indicates that it intends to participate in the environmental

decision-making procedures referred to in Article 2 (2), the Member State in whose territory the project is intended to be carried out shall, if it has not already done so, send to the affected Member State the information required to be given pursuant to Article 6 (2) and made available pursuant to Article 6 (3)
(a) and (b).

3 The Member States concerned, each insofar as it is concerned, shall also: (a) arrange for the information referred to in paragraphs 1 and 2 to be made avail- able, within a reasonable time, to the authorities referred to in Article 6 (1) and the public concerned in the territory of the Member State likely to be significantly affected; and

(b) ensure that those authorities and the public concerned are given an opportu- nity, before development consent for

•..

Article 9

When a decision to grant or refuse develop- ment consent has been taken, the competent authority or authorities shall inform the public thereof in accordance with the appropriate procedures and shall make available to the public the following information:

(a) the content of the decision and any conditions attached thereto,

(b) having examined the concerns and opinions expressed by the public con- cerned, the main reasons and considera- tions on which the decision is based, including information about the public participation process,

(c) a description, where necessary, of the main measures to avoid, reduce and, if possible, offset the major adverse effects.

the project is granted, to forward their 2
opinion within a reasonable time on the information supplied to the competent authority in the Member State in whose territory the project is intended to be carried out.

4 The Member States concerned shall enter into consultations regarding, inter alia, the potential transboundary effects of the project and the measures envisaged to reduce or eliminate such

effects and shall agree on a reasonable time frame for the duration of the

The competent authority or authorities shall inform any Member State that has been consulted pursuant to Article 7, forwarding to it the information referred to in paragraph 1 of this Article.
The consulted Member States shall ensure that information is made available in an appro- priate manner to the public concerned in their own territory.
consultation period.
5
The detailed arrangements for implementing this Article may be determined by the Member States concerned and shall be such as to enable the public concerned in the territory of the affected Member State to participate effec- tively in the environmental decision-making procedures referred to in Article 2 (2) for the project. (a)
having a sufficient interest, or altern- atively;

(b)
maintaining the impairment of a right, where administrative procedural law of a Member State requires this as a precondition;

Article 8

The results of consultations and the information gathered pursuant to Articles S, 6 and 7 must be taken into consideration in the development consent procedure.
Article 10

The provisions of this Directive shall not affect the obligation on the competent authorities to respect the limitations imposed by national regu- lations and administrative provisions and accepted legal practices with regard to commercial and industrial confidentiality, including intellectual property, and the safeguarding of the public interest.
Where Article 7 applies, the transmission of information to another Member State and the receipt of information by another Member State shall be subject to the limitations in force in the Member State in which the project is proposed.

Article 1 O(a)
Member States shall ensure that, in accordance with the relevant national legal system, members of the public concerned:
have access to a review procedure before a court of law or another independent and impartial body established by law to challenge the substantive or procedural legality of decisions, acts or omissions subject to the public participation provisions of this Directive.
Member States shall determine at what stage the decisions, acts or omissions may be challenged.
What constitutes a sufficient interest and impairment of a right shall be determined by the Member States, consistently with the objective of giving the public concerned wide access to justice. To this end, the interest of any non-governmental organisation meeting the requirements referred to in Article 1 (2), shall be deemed sufficient for the purpose of subparagraph (a) of this Article. Such organisations shall also be deemed to have rights capable of being impaired for the purpose of
subparagraph (b) of this Article.
The provisions of this Article shall not exclude the possibility of a preliminary review procedure before an administrative authority and shall not affect the requirement of exhaustion of adminis- trative review procedures prior to recourse to judicial review procedures, where such a require- ment exists under national law.
Any such procedure shall be fair, equitable, timely and not prohibitively expensive.
In order to further the effectiveness of the provisions of this article, Member States shall ensure that practical information is made available to the public on access to administrative and judicial review procedures.

Article 11
The Member States and the Commission shall exchange information on the experience gained in

applying this Directive.

2

In particular, Member States shall inform the Commission of any criteria and/or thresholds adopted for the selection of the projects in question, in accordance with Article 4 (2).

3

Five years after notification of this Directive, the Commission shall send the European Parliament and the Council a report on its application and effectiveness. The report shall be based on the aforementioned exchange of information.

4

On the basis of this exchange of information, the Commission shall submit to the Council additional proposals, should this be necessary, with a view to this Directive's being applied in a sufficiently coordinated manner.

Article 12

Member States shall take the measures necessary to comply with this Directive within three years of its notification.3

2

Member States shall communicate to the Commission the texts of the provisions of national law that they adopt in the field covered by this Directive.

Article 14

!'his Directive is addressed to the Member States.

Notes

1 OJ No L 257, 10.10.1996, p. 26.

2 OJ L 41, 14.2.2003, p. 26.

3

This Directive was notified to the Member States on 3 July 1985.

Annex I

••

Projects subject to article 4 (1)

Crude-oil refineries (excluding undertakings 4
manufacturing only lubricants from crude oil) and installations for the gasification and liquefaction of 500 tonnes or more of coal or bituminous shale per day.

2

Thermal power stations and other combustion installations with a heat

output of 300 megawatts or more, and 5
Nuclear power stations and other nuclear
reactors including the dismantling or decommissioning of such power stations or reactors1 (except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1
kilowatt continuous thermal load).

3

(a) Installations for the reprocessing of irradiated nuclear fuel;

(b) Installations designed: 6
for the production or enrichment of nuclear fuel;
for the processing of irradiated nuclear fuel or high-level radio- active waste;
for the final disposal of irradiated nuclear fuel;
solely for the final disposal of radioactive waste;
solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or radioactive waste in a different site than the production site.

Integrated works for the initial smelting of cast-iron and steel;
Installations for the production of non- ferrous crude metals from ore, concen- trates or secondary raw materials by metallurgical, chemical or electrolytic processes.
Installations for the extraction of asbestos and for the processing and transformation of asbestos and products containing asbestos: for asbestos-cement products, with an annual production of more than 20,000 tonnes of finished products, for friction material, with an annual production of more than 50 tonnes of finished products, and for other uses of asbestos, utilization of more than 200 tonnes per year.
Integrated chemical installations, i.e. those
installations for the manufacture on an industrial scale of substances using chemical conversion processes, in which several units are juxtaposed and arc functionally linked to one another and that are:
(i)
for the production of basic organic chemicals;

(ii)
for the production of basic inorganic chemicals;

(iii)
for the production of phosphorous-, nitrogen- or potassium-based fertilizers (simple or compound fertilizers);

(iv)
for the production of basic plant health products and of biocides;

(v)
for the production of basic pharmaceu- tical products using a chemical or bio- logical process;

(vi)
for the production of explosives.

7
(a) construction of lines for long-distance railway traffic and of airports2 with a basic runway length of 2100 m or more;

(b)
construction of motorways and express roads;3

(c)
construction of a new road of four or more lanes, or realignment and/or widening of an existing road of two lanes or less so as to provide four or more lanes, where such new road, or realigned and/or widened section of road would be 10 km or more in a con- tinuous length.

8
(a) Inland waterways and ports for inland- waterway traffic that permit the passage of vessels of over 1350 tonnes;

(b) Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) that can take vessels of over 1350 tonnes.
9
Waste disposal installations for the incinera- tion, chemical treatment as defined in Annex IIA to Directive 75/442/EEC4 under heading 09, or landfill of hazardous waste (i.e. waste to which Directive 91/689/EEC5 applies).

10

Waste disposal installations for the incinera- tion or chemical treatment as defined in Annex IIA to Directive 75/442/EEC under heading D9 of non- hazardous waste with a capacity exceeding 100 tonnes per day.

11
Groundwater abstraction or artificial ground- water recharge schemes where the annual volume of water abstracted or recharged is equivalent to or exceeds 10 million cubic metres.

12
(a) Works for the transfer of water resources between river basins where this transfer aims at preventing possible shortages of water and where the amount of water transferred exceeds 100 million cubic metres/year;

(b) In all other cases, works for the transfer of water resources between river basins where the multi-annual average flow of the basin of abstraction exceeds 2000 million cubic metres/year and where the amount of water transferred exceeds 5 per cent of this flow.
In both cases transfers of piped drinking water are excluded.
13
Waste water treatment plants with a capacity exceeding 150,000 population equivalent as defined in Article 2 point (6) of Directive 91/271/EEC.6

14
Extraction of petroleum and natural gas for commercial purposes where the amount extracted exceeds 500 tonnes/day in the case of petroleum and 500,000 m3/day in the case of gas.

15
Dams and other installations designed for the holding back or permanent storage of water, where a new or additional amount of water held back or stored exceeds 10 million cubic metres.

16
Pipelines with a diameter of more than 800 mm and a length of more than 40 km:

for the transport of gas, oil, chemicals; and,
for the transport of carbon dioxide (CO2) streams for the purposes of geological storage, including associated booster stations.
17
Installations for the intensive rearing of poultry or pigs with more than: (a)
85,000 places for broilers, 60,000 places for hens;

(b)
3,000 places for production pigs (over 30 kg); or

(c)
900 places for sows.

18
Industrial plants for the (a)
production of pulp from timber or similar fibrous materials;

(b)
production of paper and board with a production capacity exceeding 200 tonnes per day.

19
Quarries and open-cast mining where the surface of the site exceeds 25 hectares, or peat extraction, where the surface of the site exceeds 1SO hectares.

20
Construction of overhead electrical power lines with a voltage of 220 kV or more and a length

of more than 15 km.

21 Installations for storage of petroleum, petro- chemical, or chemical products with a capacity of 200,000 tonnes or more.

22 Any change to or extension of projects listed in this Annex where such a change or extension in itself meets the thresholds, if any, set out in this Annex.

23 Storage sites pursuant to Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxidc.7

24 Installations for the capture of CO2 streams for the purposes of geological storage pursuant

to Directive 2009/31/EC from installations covered by this Annex, or where the total yearly capture of CO2 is 1.5 mcgatonnes or more.

Notes

Nuclear power stations and other nuclear reactors cease to be such an installation when all nuclear fuel and other radioactively contaminated elements have been removed permanently from the installation site.

2 For the purposes of this Directive, 'airport' means airports that comply with the definition in the 1944 Chicago Convention setting up the International Civil Aviation Organization (Annex 14).

3 For the purposes of the Directive, 'express road'

means a road that complies with the definition in the European Agreement on Main International Traffic Arteries of 15 November 1975.

4 OJ No L 194, 25.7.1975, p. 39. Directive as last amended by Commission Decision 94/3/EC (OJ No L 5, 7.1.1994, p. 15).

5 OJ No L 377, 31.12.1991, p. 20. Directive as last amended by Directive 94/31/EC (OJ No L 168, 2.7.1994, p. 28).

6 OJ No L 135, 30.5.1991, p. 40. Directive as last amended by the 1994 Act of Accession.

7 OJ L 140, 5.6.2009, p. 114.

Annex II
•••
Projects subject to article 4 (2)

Agriculture, silviculture and aquaculture 3
2 Extractive industry
(a)
quarries, open-cast mining and peat extraction (projects not included in Annex l);

(b)
underground mining;

(c)
extraction of minerals by marine or fluvial dredging;

(d)
deep drillings, in particular: geothermal drilling,

drilling for the storage of nuclear waste material, 4
drilling for water supplies,
with the exception of drillings for investi- gating the stability of the soil;
(e)
surface industrial installations for the extraction of coal, petroleum, natural gas and ores,

as well as bituminous shale.

Energy industry

(a)
industrial installations for the production of electricity, steam and hot water (projects not included in Annex I);

(b)
industrial installations for carrying gas, steam and hot water; transmission of electrical energy by overhead cables (projects not included in Annex I);

(c)
surface storage of natural gas;

(d)
underground storage of combustible gases;

(e)
surface storage of fossil fuels;

(f)
industrial briquetting of coal and lignite;

(g)
•••••••••••

••
•••

Projects

subject

to

article
4

(ii)
smitheries with hammers;

(iii)
application of protective fused metal coats;

(a)
coke ovens (dry coal distillation);

(b)
installations for the manufacture of cement;

(c)
installations for the production of asbestos and the manufacture of asbestos-products (projects not included in Annex I);

(d)
installations for the manufacture of glass including glass fibre;

(e)

installations for smelting mineral substances including the production of mineral fibres;

(f)
manufacture of ceramic products by burning, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain.

(a)
treatment of intermediate products and production of chemicals;

(b)
production of pesticides and pharma- ceutical products, paint and varnishes, elastomers and peroxides;

(c)
storage facilities for petroleum, petro- chemical and chemical products.

(a)
manufacture of vegetable and animal oils and fats;

(b)
packing and canning of animal and vegetable products;

(c)
manufacture of dairy products;

(d)
brewing and malting;

(e)
confectionery and syrup manufacture;

(f)
installations for the slaughter of animals;

(g)
industrial starch manufacturing installa- tions;

(h)
fish-meal and fish-oil factories;

(i)
sugar factories.

(a)
industrial plants for the production of paper and board (projects not included in Annex I);

(b)
plants for the pretreatment (operations such as washing, bleaching, merceriza- tion) or dyeing of fibres or textiles;

(c)
plants for the tanning of hides and skins;

(d)
cellulose-processing and production installations.

(c)
ferrous metal foundries;

(d)
installations for the smelting, including the alloyage, of non-ferrous metals, excluding

precious metals, including recovered products (refining, foundry casting, etc.);

(e)
installations for surface treatment of metals and plastic materials using an electrolytic or chemical process;

(f)
manufacture and assembly of motor vehicles and manufacture of motor- vehicle engines;

(g)
shipyards;

(h)
installations for the construction and repair of aircraft;

(i)
manufacture of railway equipment;

(j)
swaging by explosives;

(k)
installations for the roasting and sintering of metallic ores.

5
Mineral industry

6
Chemical industry (Projects not included in

Annex I)
7
Food industry

8
Textile, leather, wood and paper indus-

tries
9
Rubber industry

Manufacture and treatment of elastomer-based products.
10
Infrastructure projects (a)
industrial estate development projects;

(b)
urban development projects, including the construction of shopping centres and car parks;

(c)
construction of railways and intermodal transshipment facilities, and of inter- modal terminals (projects not included in Annex I);

(d)
construction of airfields (projects not included in Annex I);

(e)
construction of roads, harbours and port installations, including fishing harbours (projects not included in Annex l);

(f)
inland-waterway construction not included in Annex I, canalization and flood-relief works;

(g)
dams and other installations designed to hold water or store it on a long-term basis (projects not included in Annex I);

(h)
tramways, elevated and underground railways, suspended lines or similar lines of a particular type, used exclusively or mainly for passenger transport;

(i)
oil and gas pipeline installations and pipelines for the transport of CO_2 streams

(j)
installations of long-distance aqueducts;

(k)
coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties and other sea defence works, excluding the main- tenance and reconstruction of such works; (I)
groundwater abstraction and artificial groundwater recharge schemes not in- cluded in Annex l;

for the purposes of geological storage (projects not included in Annex I);
(m) works for the transfer of water resources between river basins not included in Annex I.

11
Other projects (a)
permanent racing and test tracks for motorized vehicles;

(b)
installations for the disposal of waste (projects not included in Annex I);

(c)
waste-water treatment plants (projects not included in Annex I);

(d)
sludge-deposition sites;

(e)
storage of scrap iron, including scrap vehicles;

(f)
test benches for engines, turbines or re- actors;

(g)
installations for the manufacture of artifi- cial mineral fibres;

(h)
installations for the recovery or destruc- tion of explosive substances;

(i)
knackers' yards.

12
Tourism and leisure (a)
ski-runs, ski-lifts and cable-cars and associ- ated developments;

(b)

marinas;

(c)
holiday villages and hotel complexes outside urban areas and associated developments;

(d)
permanent camp sites and caravan sites;

(e)
theme parks.

13
- Any change or extension of projects listed in Annex I or Annex II, already authorized, executed or in the process of being executed, which may have signifi- cant adverse effects on the environment (change or extension not included in Annex I);

Projects in Annex I, undertaken exclu- sively or mainly for the development and testing of new methods or products and not used for more than two years.

Annex Ill

Selection criteria referred to in article 4 (3)

Characteristics of projects
The characteristics of projects must be considered having regard, in particular, to:
the size of the project;
the cumulation with other projects; the use of natural resources;
the production of waste; pollution and nuisances;
the risk of accidents, having regard in particular to substances or technologies used.
2 Location of projects
The environmental sensitivity of geographical 3 areas likely to be affected by projects must be considered, having regard, in particular, to:
the existing land use;
the relative abundance, quality and regenerative capacity of natural resources in the area;
the absorption capacity of the natural environment, paying particular attention to the following areas:
(a)
wetlands;

(b)
coastal zones;

(c)
mountain and forest areas;

(d)
nature reserves and parks;

(e)
areas classified or protected under Mem- ber States' legislation; special protection areas designated by Member States pur- suant to Directive 79/409/EEC and 92/43/ EEC;

(f)
areas in which the environmental quality standards laid down in Community legis- lation have

already been exceeded;

(g)
densely populated areas;

(h)
landscapes of historical, cultural or archaeological significance.

Characteristics of the potential impact The potential significant effects of projects must be considered in relation to criteria set out under 1 and 2 above, and having regard in particular to:
the extent of the impact (geographical area and size of the affected population); the transfrontier nature of the impact; the magnitude and complexity of the impact;
the probability of the impact;
the duration, frequency and reversibility of the impact.

Annex IV
••
Information referred to in article 5 (1)

Description of the project, including in particular:
a description of the physical charac- teristics of the whole project and the land- 4 use requirements during the construction
and operational phases;
a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed project.
2
An outline of the main alternatives studied by 5 the developer and an indication of the main reasons for this choice, taking into account the environmental effects. 6

3
A description of the aspects of the environ- ment likely to be significantly affected by the 7

proposed project, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the

architectural and archaeological heritage, landscape and the inter-relationship between the above factors.
A description I of the likely significant effects of the proposed project on the environment resulting from:
the existence of the project; the use of natural resources;
the emission of pollutants, the creation of nuisances and the elimination of waste; and
the description by the developer of the forecasting methods used to assess the effects on the environment.
J\ description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment. A non-technical summary of the information provided under the above headings.
An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the developer in compiling the required information.

Notes

This description should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project.

Appendix 2
••
Town and Country Planning (EIA) Regulations 2011 Schedule 2
(Regulation 2. 1)

Descriptions of development and applicable thresholds and criteria for the purposes of the definition of 'Schedule 2 development'

In the table below:

- 'area of the works' includes any area occupied by apparatus, equipment, machinery, mater- ials, plant, spoil heaps or other facilities or stores required for construction or installation;
- 'controlled waters' has the same meaning as in the Water Resources Act 1991;1
- 'floorspace' means the floorspace in a building or buildings.

The table below sets out the descriptions of development and applicable thresholds and criteria for the purpose of classifying development as Schedule 2 development.

Column 1: Description of development Column 2: Applicable thresholds and criteria
The carrying out of development to provide any of the following:

1

(a) ProJecls for the use of uncultivated land or semi-natural areas for intensive agricultural purposes;
The area of the development exceeds 0.5 hectares.

(b) Water management projects for agriculture, including irrigation and land drainage projects;
The area of the works exceeds 1 hectare.

(c) Intensive livestock installations {unless included in Schedule 1);
The area of new floorspace exceeds 500 square metres.

(d) Intensive fish farming;
The installation resulting from the development is designed to produce more than 10 tonnes of dead weight fish per year.

(e) Reclamation of land from the sea.
All development.

Column 1: Description of development Column 2: Applicable thresholds and criteria

2

(a)
Quarries, open-cast mining and peal extraction (unless included in Schedule 1);

(b)
Underground mining;

All development except the construction of buildings or other ancillary structures where the new floorspace does not exceed 1,000 square metres.

(c) Extraction of minerals by fluvial or marine dredging;
All development.

(d)
Deep drillings, in particular: (i)
geothermal drilling;

(ii)
drilling for the storage of nuclear waste material;

(iii)
drilling for waler supplies;

with the exception of drillings for investigating the stability of the soil;
(i)
In relation to any type of drilling, the area of the works exceeds 1 hectare; or

(ii)
in relation to geothermal drilling and drilling for the storage of nuclear waste material, the drilling is within 100 metres of any controlled waters.

(e) Surface industrial installations for the extraction of coal, petroleum, natural gas and ores, as well as bituminous shale.
The area of the development exceeds 0.5 hectares.

3

(a) Industrial installations for the production of electricity, steam and hot water (unless included in Schedule 1);

The area of the development exceeds 0.5 hectares.

(b) Industrial installations for carrying gas, steam and hot water;
The area of the works exceeds 1 hectare.

(c)
Surface storage of natural gas;

(d)
Underground storage of combustible gases;

(e)
Surface storage of fossil fuels;

(i)
The area of any new building, deposit or structure exceeds 500 square metres; or

(ii)
a new building, deposit or structure is to be siled within 100

metres of any controlled waters.

(f) Industrial briquetting of coal and lignite;
The area of new floorspace exceeds 1,000 square metres.

(g) Installations for the processing and storage of radioactive waste (unless included in Schedule 1);
(i)
The area of new floorspace exceeds 1,000 square metres; or

(ii)
the installation resulting from the development will require the grant of an environmental permit under the Environmental Permitting (England and Wales). Regulations 2010(2) in relation to a radioactive substances activity described in paragraphs 5 (2) (b), (2) (c) or (4) of Part 2 of Schedule 23 to those Regulations,

or the variation of such a permit.

(h) Installations for hydroelectric energy production;
The installation is designed to produce more than 0.5 megawatts.

(i) Installations for the harnessing of wind power for energy production (wind farms);
(i)
The development involves the installation of more than 2 turbines; or;

(ii)
the hub height of any turbine or height of any other structure

exceeds 15 metres.

Gl Installations for the capture of carbon dioxide streams for the purposes of geological storage pursuant to Directive 2009/31 /EC from installations not included in Schedule 1.
All development.

Column 1: Description of development Column 2: Applicable thresholds and criteria

(a)
Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting;

(b)
Installations for the processing of ferrous metals: (i)
hot-rolling mills;

(ii)
smitheries with hammers;

(iii)
application of protective fused metal coals.

(c)
Ferrous metal foundries;

(d)
Installations for the smelling, including the alloyage, of non- ferrous metals, excluding precious metals, including recovered products (refining, foundry casting, etc.);

(e)
Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process;

(f)
Manufacture and assembly of motor vehicles and

manufacture of motor-vehicle engines;
(g)
Shipyards;

(h)
Installations for the construction and repair of aircraft;

(i)
Manufacture of railway equipment;

G) Swaging by explosives;
(k) Installations for the roasting and sintering of metallic ores.
The area of new floorspace exceeds 1,000 square metres.

(a)
Coke ovens (dry coal distillation);

(b)
Installations for the manufacture of cement;

(c)
Installations for the production of asbestos and the manufacture of asbestos-based products (unless included in Schedule 1);

(d)
Installations for the manufacture of glass including glass fibre;

(e)
Installations for smelting mineral substances including the production of mineral fibres;

(f)
Manufacture of ceramic products by burning, in particular

roofing tiles, bricks, refractory bricks, tiles, stonewear or porcelain.
The area of new floorspace exceeds 1,000 square metres.

Column 1: Description of development Column 2: Applicable thresholds and criteria

6

(a)
Treatment of intermediate products and production of chemicals;

(b)
Production of pesticides and pharmaceutical products, paint

and varnishes, elastomers and peroxides;
The area of new floorspace exceeds 1,000 square metres.

(c) Storage facilities for petroleum, petrochemical and chemical products.
(i)
The area of any new building or structure exceeds 0.05 hectares; or

(ii)
more than 200 tonnes of petroleum, petrochemical or

chemical products is to be stored at any one time.

7 Food industry

(a)
Manufacture of vegetable and animal oils and fats;

(b)
Packing and canning of animal and vegetable products;

(c)
Manufacture of dairy products;

(d)
Brewing and malting;

(e)
Confectionery and syrup manufacture;

(f)
Installations for the slaughter of animals;

(g)
lnduslrial starch manufacturing installations;

(h)
Fish-meal and fish-oil factories;

(i)
Sugar factories.

The area of new floorspace exceeds 1,000 square metres.

8

(a)
Industrial plants for the production of paper and board (unless included in Schedule 1);

(b)
Plants for the pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles;

(c)
Plants for the tanning of hides and skins;

(d)
Cellulose-processing and production installations.

The area of new floorspace exceeds 1,000 square metres.

9

Manufacture and treatment of elastomer-based products.
The area of new floorspace exceeds 1,000 square metres.

Column 1: Description of development Column 2: Applicable thresholds and criteria

10

(a)
Industrial estate development proJects;

(b)
Urban development projects, including the construction of shopping centres and car parks, sports stadiums, leisure centres and multiplex cinemas;

(c)
Construction of intermodal transshipment facilities and of

intermodal terminals (unless included in Schedule 1);
The area of the development exceeds 0.5 hectares.

(d) Construction of railways (unless included in Schedule 1);
The area of the works exceeds 1 hectare.

(e) Construction of airfields (unless included in Schedule 1);
(i)
The development involves an extension to a runway; or

(ii)
the area of the works exceeds 1 hectare.

(f) Construction of roads (unless included in Schedule 1);
The area of the works exceeds 1 hectare.

(g) Construction of harbours and port installations including fishing harbours (unless included in Schedule 1);
The area of the works exceeds 1 hectare.

(h)
Inland-waterway construction not included in Schedule 1, canalisation and flood-relief works;

(i)
Dams and other installations designed to hold water or store it on a long-term basis (unless included in Schedule 1);

G) Tramways, elevated and underground railways, suspended lines or similar lines of a particular type, used exclusively or mainly for passenger transport;
The area of the works exceeds 1 hectare.

(k)
Oil and gas pipeline installations and pipelines for the transport of carbon dioxide slreams for lhe purposes of geological storage {unless included in Schedule 1); (I)
Installations of long-distance aqueducts;

(i)
The area of the works exceeds 1 hectare; or

(ii)
in lhe case of a gas pipeline, the installation has a design operating pressure exceeding 7 bar gauge.

(m) Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties and other sea defence works, excluding the maintenance and reconstruction of such works;
All development.

(n)
Groundwaler abstraction and artificial groundwater recharge schemes not included in Schedule 1
;

(o)
Works for the transfer of water resources between river

basins not included in Schedule 1;
The area of the works exceeds 1 hectare.

(p) Motorway service areas.
The area of the development exceeds 0.5 hectares.

Column 1: Description of development Column 2: Applicable thresholds and criteria

1

(a) Permanent racing and test tracks for motorised vehicles;
The area of the development exceeds 1 hectare.

(b) Installations for the disposal of waste {unless included in Schedule 1);
(i)
The disposal is by incineration; or

(ii)
the area of the development exceeds 0.5 hectare; or

(iii)
the installation is to be sited within 100 metres of any controlled waters.

(c) Waste-water treatment plants (unless included in Schedule 1);
The area of the development exceeds 1,000 square metres.

(d)
Sludge-deposition sites;

(e)
Storage of scrap iron, including scrap vehicles;

(i)
The area of deposit or storage exceeds 0.5 hectare; or

(ii)
a deposit is to be made or scrap stored within 100 metres of any controlled waters.

(f)
Test benches for engines, turbines or reactors;

(g)
Installations for the manufacture of artificial mineral fibres;

(h)
Installations for the recovery or destruction of explosive substances;

(i)
Knackers' yards.

The area of new floorspace exceeds 1,000 square metres.

12

(a) Ski-runs, ski-lifts and cable-cars and associated developments;
(i)
The area of the works exceeds 1 hectare; or

(ii)
the height of any building or other structure exceeds 15 metres.

(b) Marinas;
The area of the enclosed water surface exceeds 1 ,000 square metres.

(c)

Holiday villages and hotel complexes outside urban areas and associated developments;

(d)
Theme parks;

The area of the development exceeds 0.5 hectares.

(e) Permanent camp sites and caravan sites;
The area of the development exceeds 1 hectare.

(f) Golf courses and associated developments.
The area of the development exceeds 1 hectare.

Column 1: Description of development Column 2: Applicable thresholds and criteria

13

(a) Any change to or extension of development of a description listed in Schedule 1 (other than a change or extension falling within paragraph 21 of that Schedule) where that development is already authorised, executed or in the process of being executed.

Either:

(i)
The development as changed or extended may have significant adverse effects on the environment; or

(ii)
in relation to development of a description mentioned in a paragraph in Schedule 1 indicated below, the thresholds and criteria in column 2 of the paragraph of this table indicated below applied to the change or extension are met or exceeded.

Paragraph in Schedule I	Paragraph of this table
1	6 (a)
2 (a)	3 (a)
2 (b)	3 (g)
3	3 (g)
4	4
5	5
6	6 (a)
7 (a)	10 (d) (in relation to railways) or 10 (el (in relation to airports)
7 (b) and (c)	10 (f)
8 (a)	10 (h)
8 (b)	10 (g)
9	11 (b)
10	11 (b)
11	10 (n)
12	10 (o)
13	11 (c)
14	2 (e)
15	10 (i)
16	10 (kl
17	1 (c)
18	8 (a)
19	2 (a)
20	6 (c)

(bl Any change lo or extension of development of a description listed in paragraphs 1 to 12 of column 1 of this table, where that development is already authorised, executed or in the process of being executed.

Either-

(i)

The development as changed or extended may have significant adverse effects on the environment; or

(ii)

in relation to development of a description mentioned in column 1 of this table, the thresholds and criteria in the corresponding part of column 2 of this table applied to the

change or extension are met or exceeded.

(cl Development of a description mentioned in Schedule 1 undertaken exclusively or mainly for the development and testing of new methods or products and not used for more than two years.

All development.

Notes

1991 c. 57. Sea section 104.
2 S.I. 2010/675.

Appendix 3

Full text of the European Commission's SEA Directive

Directive 2001 / 42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

Article 1: Objectives

The objective of this Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adop- tion of plans and programmes with a view to pro- moting sustainable development, by ensuring that, in accordance with this Directive, an envir- onmental assessment is carried out of certain plans and programmes that are likely to have significant effects on the environment.

Article 2: Definitions

For the purposes of this Directive:

(a)

'plans and programmes' shall mean plans and programmes, including those co-financed by the European Community, as well as any modifications to them:

which are subject to preparation and/or adoption by an authority at national, regional or local level or which are
prepared by an authority for adoption, through a legislative procedure by Parlia- ment or Government, and
which are required by legislative, regu- latory or administrative provisions;

(b)
'environmental assessment' shall mean the preparation of an environmental report, the carrying out of consultations, the taking into account of the environmental report and the results of the consultations in decision-making and the provision of information on the decision in accordance with Articles 4 to 9;

(c)
'environmental report' shall mean the part of the plan or programme documentation con- taining the information required in Article 5 and Annex I;

(d)
'The public' shall mean one or more natural or legal persons and, in accordance with national legislation or practice, their associa- tions, organisations or groups.

Article 3: Scope

An environmental assessment, in accordance with Articles 4 to 9, shall be carried out for plans and programmes referred to in para- 7 graphs 2 to 4, which arc likely to have signifi- cant environmental effects.
2
Subject to paragraph 3, an environmental assessment shall be carried out for all plans and programmes, 8 (a)
which are prepared for agriculture, forestry, fisheries, energy, industry, trans- port, waste management, water man- agement, telecommunications, tourism, town and country planning or land use and which set the framework for future development consent of projects listed in 9

(b)
which, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of Directive 92/43/EEC.

Annexes I and II to Directive 85/337/EEC, or
3
Plans and programmes referred to in paragraph

Member States shall ensure that their conclu- sions pursuant to paragraph 5, including the reasons for not requiring an environmental assessment pursuant to Articles 4 to 9, are made available to the public.
The following plans and programmes are not subject to this Directive:
plans and programmes the sole purpose of which is to serve national defence or civil emergency;
financial or budget plans and program- mes.
rhis Directive does not apply to plans and programmes co-financed under the current respective programming periods1 for Council Regulations (EC) No 1260/19992 and (EC) No 1257/1999.3
2 that determine the use of small areas at local level and minor modifications to plans and
Article 4: General obligations
programmes referred to in paragraph 2 shall 1 require an environmental assessment only where the Member States determine that they
are likely to have significant environmental effects.
4
Member States shall determine whether plans 2 and programmes, other than those referred

to in paragraph 2, which set the framework for future development consent of projects, are likely to have significant environmental
effects. 3
s Member States shall determine whether plans or programmes referred to in paragraphs 3 and 4 are likely to have significant environ- mental effects either through case-by-case examination or by specifying types of plans and programmes or by combining both approaches. For this purpose

Member States shall in all cases take into account relevant criteria set out in Annex II, in order to ensure that plans and programmes with likely significant effects on the environment are covered
The environmental assessment referred to in Article 3 shall be carried out during the preparation of a plan or programme and before its adoption or submission to the legislative procedure.
The requirements of this Directive shall either be integrated into existing procedures in Member States for the adoption of plans and programmes or incorporated in procedures established to comply with this Directive.
Where plans and programmes form part of a hierarchy, Member States shall, with a view to avoiding duplication of the assessment, take into account the fact that the assessment will be carried out, in accordance with this Directive, at different levels of the hierarchy. For the purpose of, inter alia, avoiding duplication of assessment, Member States shall apply Article 5 (2) and (3).
by this Directive.
6 In the case-by-case examination and in specifying types of plans and programmes in accordance with paragraph 5, the author- ities referred to in Article 6 (3) shall be consulted.
Article 5: Environmental report

Where an environmental assessment is required under Article 3 (1), an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and 4 reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated. The information to be given for this purpose is referred to in Annex I.
2
The environmental report prepared pursuant

to paragraph 1 shall include the information S that may reasonably be required taking into account current knowledge and methods of assessment, the contents and level of detail in the plan or programme, its stage in the decision-making process and the extent to which certain matters are more appropriately
Member States shall identify the public for the purposes of paragraph 2, including the public affected or likely to be affected by, or having an interest in, the decision-making subject to this Directive, including relevant non- governmental organisations, such as those promoting environmental protection and other organisations concerned.
The detailed arrangements for the information and consultation of the authorities and the public shall be determined by the Member States.
assessed at different levels in that process in order to avoid duplication of the assessment.
3
Relevant information available on environ- mental effects of the plans and programmes and obtained at other levels of decision- making or through other Community legis- lation may be used for providing the inform- ation referred to in Annex I.

4
The authorities referred to in Article 6 (3) shall be consulted when deciding on the scope and level of detail of the information that must be included in the environmental report.

Article 7: Transboundary consultations

Where a Member State considers that the implementation of a plan or programme being prepared in relation to its territory is likely to have significant effects on the environment in another Member State, or where a Member State likely to be significantly affected so requests, the Member State in whose territory the plan or programme is being prepared shall, before its adoption or submission to the legislative procedure, forward a copy of the draft plan or programme and the relevant
environmental report to the other Member
Article 6: Consultations
2
The draft plan or programme and the environ- mental report prepared in accordance with Article S shall be made available to the authorities referred to in paragraph 3 of this Article and the public.
2
The authorities referred to in paragraph 3 and the public referred to in paragraph 4 shall be given an early and effective opportunity within appropriate time frames to express their

opinion on the draft plan or programme and the accompanying environmental report before the adoption of the plan or programme or its submission to the legislative procedure.

3
Member States shall designate the authorities to be consulted that, by reason of their specific environmental responsibilities, are likely to be concerned by the environmental effects of implementing plans and programmes.

State.
Where a Member State is sent a copy of a draft plan or programme and an environmental report under paragraph I, it shall indicate to the other Member State whether it wishes to enter into consultations before the adoption of the plan or programme or its submission to the legislative procedure and, if it so indicates, the Member States concerned shall enter into consultations concerning the likely transboundary environmental effects of implementing the plan or programme and the measures envisaged to reduce or eliminate such effects.
Where such consultations take place, the Member States concerned shall agree on de- tailed arrangements to ensure that the author- ities referred to in Article 6 (3) and the public referred to in Article 6 (4) in the Member State likely to be significantly affected are informed
and given an opportunity to forward their opinion within a reasonable time-frame.
3 Where Member States arc required under this Article to enter into consultations, they shall agree, at the beginning of such consultations, on a reasonable timeframe for the duration of the consultations.

Article 10: Monitoring

1
Member States shall monitor the significant environmental effects of the implementation of plans and programmes in order, inter olia, to identify at an early stage unforeseen adverse effects, and to be able to undertake appropriate remedial action. (a)
the plan or programme as adopted;

(b)
a statement summarizing how environ- mental considerations have been inte- grated into the plan or programme and how the environmental report prepared pursuant to Article 5, the opinions ex- pressed pursuant to Article 6 and the results of consultations entered into pursuant to Article 7 have been taken into account in accordance with Article 8 and the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with; and

Article 8: Decision making 2
The environmental report prepared pursuant to Article 5, the opinions expressed pursuant to Article 6 and the results of any transboundary consultations entered into pursuant to Article 7 shall be taken into account during the preparation
In order to comply with paragraph 1, existing monitoring arrangements may be used if appropriate, with a view to avoiding duplica- tion of monitoring.
of the plan or programme and before its adoption or submission to the legislative procedure.

Article 9: Information on the decision

Member States shall ensure that, when a plan or programme is adopted, the authorities referred to in Article 6 (3), the public and any Member State consulted under Article 7 are informed and the following items are made available to those so informed:
{c) the measures decided concerning moni- toring in accordance with Article 10.
2
The detailed arrangements concerning the information referred to in paragraph 1 shall be determined by the Member States.

Article 11: Relationship with other Community legislation

An environmental assessment carried out under this Directive shall be without prejudice to any requirements under Directive 85/337/ EEC and to any other Community law requirements.

2

For plans and programmes for which the obligation to carry out assessments of the effects on the environment arises simultan- eously from this Directive and other Com- munity legislation, Member States may provide for coordinated or joint procedures fulfilling the requirements of the relevant Community legislation in order, inter a/ia, to avoid duplication of assessment.

3

for plans and programmes co-financed by the European Community, the environmental assessment in accordance with this Directive shall be carried out in conformity with the specific provisions in relevant Community legislation.

Article 12: Information, reporting and review

Member States and the Commission shall exchange information on the experience gained in applying this Directive.

2

Member States shall ensure that environ- mental reports arc of a sufficient quality to meet the requirements of this Directive and 3 shall communicate to the Commission any measures they take concerning the quality of these reports.

3

Before 21 July 2006 the Commission shall send a first report on the application and effectiveness of this Directive to the European Parliament and to the Council.

With a view further to integrating environ- mental protection requirements, in accordance with Article 6 of the Treaty, and taking into account the experience acquired in the application of this Directive in the Member 4 States, such a report will be accompanied by proposals for amendment of this Directive, if appropriate. In particular, the Commission will consider the possibility of extending the scope of this Directive to other areas/sectors and other types of plans and programmes.

A new evaluation report shall follow at seven-year intervals.

4

The Commission shall report on the relation- ship between this Directive and Regulations (EC) No 1260/1999 and (EC) No 1257/1999 well ahead of the expiry of the programming

methods of making such reference shall be laid down by Member States.

The obligation referred to in Article 4 (1) shall apply to the plans and programmes of which the first formal preparatory act is subsequent to the date referred to in paragraph 1. Plans and programmes of which the first formal preparatory act is before that date and which are adopted or submitted to the legislative procedure more than 24 months thereafter, shall be made subject to the obligation referred to in Article 4 (1) unless Member States decide on a case by case basis that this is not feasible and inform the public of their decision.

Before 21 July 2004, Member States shall communicate to the Commission, in addition to the measures referred to in paragraph 1, separate information on the types of plans and programmes that, in accordance with Article 3, would be subject to an environmental assessment pursuant to this Directive. The Commission shall make this information available to the Member States. The informa- tion will be updated on a regular basis.

periods provided for in those Regulations, with a view to ensuring a coherent approach with regard to this Directive and subsequent Community Regulations.

Article 13: Implementation of the Directive

Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive before 21 July 2004. They shall forthwith inform the Commission thereof.

2 When Member States adopt the measures, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. The

Article 14: Entry into force

This Directive shall enter into force on the day of its publication in the Official Journal of the European Communities.

Article 15: Addressees

This Directive is addressed to the Member States. Done at Luxembourg, 27 June 2001.

For the European Parliament The President
N. FONTAINE For the Council The President
B. ROSENGREN

Notes

The 2000-06 programming period for Council Regulation (EC) No 1260/1999 and the 2000-06 and 2000-07 programming periods for Council Regulation (EC) No 1257/1999.

2
Council Regulation (EC) No 1 260/1999 of 21 June

1999 laying down general provisions on the Structural Funds (OJ l 161, 26.6.1999, p. 1).

3
Council Regulation (EC) No 1257/1999 of 17 May 1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund {EAGGF) and amending and

repealing certain regulations (OJ L 160, 26.6.1999, p 80).

Annex I

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Information referred to in Article 5 (1)

The information to be provided under Article 5 (1), subject to Article 5 (2) and (3), is the following:

information

to

Annex II

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Criteria for determining the likely significance of effects referred to in Article 3 (5)

The characteristics of plans and programmes, 2 having regard, in particular, to
the degree to which the plan or pro- gramme sets a framework for projects and other activities, either with regard to the location, nature, size and operating con- ditions or by allocating resources;
the degree to which the plan or program- me influences other plans and program- mes including those in a hierarchy;
the relevance of the plan or programme for the integration of environmental considerations in particular with a view to promoting sustainable development; environmental problems relevant to the plan or programme;
the relevance of the plan or programme for the implementation of Community legislation on the environment (e.g. plans and programmes linked to waste-manage- ment or water protection).

Characteristics of the effects and of the area likely to be affected, having regard, in particular, to
the probability, duration, frequency and reversibility of the effects;
the cumulative nature of the effects;

the transboundary nature of the effects; the risks to human health or the environ- ment (e.g. due to accidents);
the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected);
the value and vulnerability of the area likely to be affected due to:
The characteristics

Appendix 4

•••

The Lee and Colley review package

The Lee and Colley method reviews EISs under four main topics, each of which is examined under a number of sub-headings:

Description of the development, the local environment and the baseline conditions:

- description of the development
- site description
- residuals
- baseline conditions

2 Identification and evaluation of key impacts:

- identification of impacts
- prediction of impact magnitudes
- assessment of impact significance

3 Alternatives and mitigation:

- alternatives
- mitigation
- commitment to mitigation

4 Communication of results:

- presentation
- balance
-

non-technical summary

In outline, the content and quality of the environmental statement is reviewed under each of the subheads, using a sliding scale of assessment symbols A-F:

Grade A indicates that the work has generally been well performed with no important omissions.
Grade B is generally satisfactory and complete with only minor omissions and inadequacies.
Grade C is regarded as just satisfactory despite some omissions or inadequacies.
Grade D indicates that parts arc well attempted but, on the whole, just unsatisfactory because of omissions or inadequacies.
Grade E is not satisfactory, revealing significant omissions or inadequacies.
Grade F is very unsatisfactory with important task(s) poorly done or not attempted.

Having analysed each sub-head, aggregated scores are given to the four review areas, and a final summary grade is attached to the whole statement.

Appendix 5

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Environmental impact statement review package (IAU, Oxford Brookes University)

Using the review packages

The !AU review package was developed for a research project into the changing quality of E!Ss that was funded by the DoE, the Scottish and Welsh Offices in 1995/96. The package is a robust mechanism for systematically reviewing E!Ss. The full review package has been updated to combine the requirements of the 2011 EIA Regulations, the DoE checklist, a review package developed by Manchester University, an EU review checklist as well as notions of best practice developed by the IAU. The package is divided into 8 sections and within each section are a number of individual review criterion. In all, the package assesses the quality of an EIS against 92 criteria, some of which are not necessarily relevant to all projects. Each criterion is graded on the basis of the quality of the material provided and each section is then awarded an overall grade. From the grades given to each section an overall grade for the EIS is arrived at. The !AU review grades are based upon the grading system developed by Manchester University for their review package. These grades are:

A= indicates that the work has generally been well performed with no important omissions;
B = is generally satisfactory and complete with only minor omissions and inadequacies;
C = is regarded as just satisfactory despite some omissions or inadequacies;

D = indicates that parts are well attempted but, on the whole, just unsatisfactory because of omissions or inadequacies;
E = is not satisfactory, revealing significant omissions or inadequacies;
F = is very unsatisfactory with important task(s) poorly done or not attempted.

These grades can be used to test an EIS's compliance with the relevant Regulations, with the pass/fail mark lying between grades 'C' and 'D'. By using this grading system the reviewer can more readily identify the aspects of the EIS that need completing and because the grades are well estab- lished the competent authority can confidently justify any requests for further information. The assessment of EIS quality against these grades is rather like the marking of an academic essay in that while the activity - i.e. review - is carried out independently, objectively and systematically, the attributing of individual grades to individual criterion is inherently subjective. One way of reducing the subjectivity of the review is for the EIS to be assessed by two independent reviewers on the basis of a 'double blind' approach. Here each reviewer assesses the EIS against the criteria and grades the EIS on the basis of 'A' to T for each criterion and for the ES as a whole. The reviewers then compare results and agree grades. In arriving at overall grades, from all of the individual grades, a decision must be made over whether, for example, an 'A' grade for one area outweighs a 'D' grade for another area. This will depend entirely on perspective, as an individual reviewer may consider some aspects to be more important than others and so it is not a simple matter of counting up all of the 'A', 'B' and 'Cs' and giving an overall grade based on the most common or average grade. In some cases a clear 'F' grade for one of the minimum regulatory requirements (e.g. non-technical summary) could be seen as resulting in an overall fail for the EIS because of the importance of that particular aspect. Other areas (e.g. consideration of alternatives) may be seen as less crucial where that aspect is not of particular relevance to the project in question. An 'F' grade for one such criteria, may not, in such cases, prevent an EIS being attributed a 'C' grade, or above, overall. Attributing the overall grade for an EIS through this process requires the reviewer to come to a judgement on the weight to be given to the individual review areas and is rather like attributing weight to planning considerations.

The success of EIS review relies a great deal on the experience of the reviewer and their ability to make a judgement on the quality of the EIS as a whole, based upon the systematic assessment of its parts. In reviewing the EIS a reviewer should come to a view on the information provided based upon a balance between:

- what it 'must' contain;
- what it could contain; and
- what it can be reasonably expected to contain.

Oxford Brookes University Impacts Assessment Unit

Environmental Impact Statement Review Package

Name of Project:

EIS Submitted by:

Date Submitted:

Review Grades

A = Relevant tasks well performed, no important tasks left incomplete.

B = Generally satisfactory and complete, only minor omissions and inadequacies.

C = Can be considered just satisfactory despite omissions and/or inadequacies.

I) = Parts are well attempted but must, as a whole, be considered just unsatisfactory because of omissions and/or inadequacies.

E = Not satisfactory, significant omissions or inadequacies.

F = Very unsatisfactory, important task(s) poorly done or not attempted.

NA = Not applicable in the context of the EIS or the project.

1 DESCRIPTION OF THE DEVELOPMENT

Crite	Review grade	Com
Principal features of the project		
1.1 Explains the purpose(s) and objectives of the development.		

1.2 Indicates the nature and status of the decision(s) for which the environmental information has been prepared.

1.3 Gives the estimated duration of the construction, operational and, where appropriate, decommissioning phase, and the programmewithin these phases.

the site, design and size of the development.·
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description of the development.

1.6 Indicates the physical presence or appearance of the completed development within the receiving environment.

1.7 Describes the methods of construction.

1.8 Describes the nature and methods of production or other types of activity involved in the operation of the project.

1.9 Describes any additional services (water, electricity, emergency seNices etc.) and developments required as a consequence of the project.

1.10 Describes the project's potential for accidents, hazards and emergencies.

Land requirements

1.11 Defines the land area taken up by the development and/or construction site and any associated arrangements, auxiliary facilities and landscaping areas, and shows their location clearly on a map.
For a linear project, describes the land corridor, vertical and horizontal alignment and need for tunnelling and earthworks.

1.12 Describes the uses to which this land will be put, and demarcates the different land use areas.

1.13 Describes the reinstatement and after-use of landtake during construction.

Project inputs

construction and operational phases.
---
during both construction and operation.

1.16 Describes their access to the site and likely means of transport.

1.17 Indicates the means of transporting materials and products to and from the site during construction and operation, and the number of movements involved.

Residues and emissions

1.18
Estimates the types and quantities of waste matter, energy (noise, vibration, light, heat, radiation etc.) and residual materials generated during construction and operation of the project, and rate at which these will be produced.
Indicates how these wastes and residual materials are expected to be handled/treated prior to release/disposal, and the routes by which they will eventually be disposed of to the environment.

1.19

1.20 Identifies any special or hazardous wastes (defined as ...) which will be produced, and describes the methods for their disposal as regards their likely main environmental impacts.

1.21 Indicates the methods by which the quantities of residuals and wastes were estimated. Acknowledges any uncertainty, and gives ranges or confidence limits where appropriate.
1

DESCRIPTION

OF

THE

2
DESCRIPTION OF THE ENVIRONMENT 2.1
Indicates the area expected to be significantly affected by the various aspects of the project with the aid of suitable maps. Explains the time over which these

2.2
Describes the land uses on the site(s) and in surrounding areas.

Criterion
Review grade
Comments

Description of the area occupied by and surrounding the project

impacts are likely to occur.
-

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2.3 Defines 1he affected environment broadly enough to include any potentially significant effects occurring away from the immediate areas of construction and operation. These may be caused by, for example, the dispersion of pollutants, infrastruc1ural requirements of the project, 1raffic e1c.

Baseline conditions

2.4

2.5
Identifies and describes the components of the affected environment potentially affected by the project.
-
The methods used to investigate the affected environment are appropriate to the size and complexity of the assessment task. Uncertainty is indicated.

2.6
--
Predicts the likely future environmental conditions in 1he absence of the project. Identifies variability in natural systems and human use.

27 Uses existing technical data sources, including records and studies carried out for environmental agencies and for special interest groups.

2.8 Reviews local, regional and national plans and policies, and other data collected as necessary to predict future environmental conditions. Where the proposal does not conform to these plans and policies, the departure is justified.

29 Local, regional and national agencies holding information on baseline environmental conditions have been approached.

Overall Grade for Section 1 =
Comments

3
SCOPING, CONSULTATION AND IMPACT IDENTIFICATION

-

Criterion
Review grade
Ccmments

Scoping and consultation
-
3,1 There has been a genuine attempt to contact the general public, relevant public agencies, relevant experts and special interest groups to appraise them of the project and its implication. Lists the groups approached.

- -

-

3.2 Statutory consultees have been contacted. Lists the consultees approached.

3,3 Identifies valued environmental attributes on the basis of this consultation,

3.4 Identifies all proJect activrties with significant impacts on valued environmental attributes. Identifies and selec1s key impacts for more intense investigation. Describes and Justifies the scoping methods used.

3.5 Includes a copy or summary of the main comments from consultees and the public, and measures taken to respond to these comments.

Impact identification

3.6 Provides the data required to identify the main effects that the development is likely to have on the environment. 1

3.12
The investigation oi each type of impact is appropriate to i1s importance for the decision, avoiding unnecessary information and concentrating on the key issues. 3.13
Considers impacts that may not themselves be significant but that may contribute

Criterion Review grade Comments

3.7

3.8 Investigates 1he above types of impacts in so far as they affect: human beings, flora, fauna, soil, water, air, climate, landscape, interac1ions between the above, material assets, culturaJ heritage.

3.9 Also noise, land use, historic heri1age, communrties.

3.10 If any of the above are no1 of concern in relation to the specific project and its location, this is clearly stated.

3.11 Identifies impacis using a systematic methodology such as proJeci specific checklists, matrices, panels of experts, extensive consultations, e1c. Describes the methods/approaches used and the rationale for using them.

-

incrementally to a significant effect.

3.14 Considers impacts that might arise from non-standard operating conditions, accidents and emergencies.

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3. 15 If the nature of the project is such that accidents are possible that might cause severe damage within the surrounding environment, an assessment of the probability and likely consequences of such events is carried out and the main findings reported.

-

Overall Grade for Section 1 "'

Comments

4

PREDICTION AND EVALUATION OF IMPACTS

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Criterion

Review grade

Comments

Prediction of magnitude of impacts
--- -
4.1 Describes impac1s in terms of the nature and magnitude of the change occurring and the nature, location, number, value, sensitivity of the affected receptors.

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4.2 Predicts the timescale over which the effects will occur, so that it is clear whether impacts are short, medium or long term, temporary or permanent, reversible or irreversible.

attached to the results.
Methods and data

-

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4.5 Provides the data required to assess the main effects that the development is likely to have on the environment.1

4.6 The methods used to predic1 the nature, size and scale of impacts are described, and are appropriate to the size and importance of the projected disturbance.

4.3
Where possible, expresses impact predictions in quantitative terms. Qualitative descriptions, where necessary, are as fully defined as possible.

4.4
Describes the likelihood of impacts occurring, and the level of uncertainty

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Criterion Review grade Comments

4.7

Evaluation of impact significance

4.8 Discusses the significance of effects in tenms of the impact on the local community (including distribution of impacts) and on the protection of environmental resources.

4.9 Discusses the available standards, assumptions and value systems that can be used to assess significance.

4.10 Where there are no generally accepted standards or criteria for the evaluation of significance, alternative approaches are discussed and, if so, a clear distinction is made between fact, assumption and professional judgement.

4.11 Discusses the significance of effects laking into account the appropriate national and international standards or norms, where these are available. Otherwise the magnitude, location and duration of the effects are discussed in conjunction with the value, sensitivity and rarity of the resource.

4.12 Differentiates project-generated impacts from other changes resulting from non-project activities and variables.

4,13 Includes a clear indication of which impacts may be significant and which may not and provides justification for this distinction.

Overall Grade for Section 4 =
Comments

5
ALTERNATIVES

Criterion
Review
Comments

5.1 Provides an outline of the main alternatives studied and gives an indication of the main reasons for their choice, taking into account
the environmental effects.1

5.2
Considers the 'no action' alternative, alternative processes, scales, layouts, designs and operating conditions where available at an early stage of project planning, and investigates their main environmental advantages and disadvantages.
If unexpectedly severe adverse impacts are identified during the course of the investigation, which are difficult to mitigate, alternatives rejected in the earlier
planning phases are re-appraised.

5.3

5.4 The alternatives are realistic and genuine.

5,5 Compares the alternatives' main environmental impacts clearly and objectively with those of the proposed project and with the likely future environmental
conditions without the project.

Overall Grade for Section 5 =
Comments

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6
MITIGATION AND MONITORING 6.8
The scale of any proposed monitoring arrangements corresponds to the potential scale and significance of deviations from expected impacts.

6.9
Investigates and describes any adverse environmental effects of mitigation

Criterion
Review grade
Comments

Description of mitigation measure

6.1 Provides a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.

6.2 Mitigation measures considered include modification of project design, construction and operation, the replacement cf facilities/resources, and the creation of new resources, as well as 'end-of-pipe' technologies for pollution control.

6.3 Describes the reasons for choosing the particular type of mitigation, and the other options available.

6.4 Explains the extent to which the mitigation methods will be effective. Where the effectiveness is uncertain, or where mitigation may not work, this is made clear and data are introduced to justify the acceptance of these assumptions.

6.5 Indicates the significance of any residual or unmitigated impacts remaining after

mitigation, and justifies why these impacts should not be mitigated.

Commitment to mitigation and monitoring

6.6 Gives details of how the mitigation measures will be implemented and function

over the time span for which they are necessary.

6.7 Proposes monitoring arrangements for all significant impacts, especially where

uncertainty exists, to check the environmental impact resulting from the

implementation of the project and its conformity with the predictions made.

-
Environmental effects of mitigation
-- -
measures.

-

-

-

-

6.10 Considers the potential for conflict between the benefits of mitigation measures and their adverse impacts.

Overall Grade for Seclion 6 =
Comments

7
NON-TECHNICAL SUMMARY

Criterion
Review
Comments

7.1 There is a non-technical summary of the information provided under paragraphs 1 to 4 of Part 2 of Schedule 4.1

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7.2 The non-technical summary contains at least a brief description of the project and the environment, an account of the main mitigation measures to be undertaken by the developer, and a description of any remaining or residual impacts.

7.3
The summary avoids technical terms, lists of data and detailed explanations of scientific reasoning.
The summary presents the main findings of the assessment and covers all the main issues raised in the information.

7.4

7.5
The summary includes a brief explanation of the overall approach to the assessment.
The summary indicates the confidence that can be placed in the results.

7.6

Overall Grade for Section 7 =
Comments

8
ORGANISATION AND PRESENTATION OF INFORMATION

Criterion
Review grade
Comments

Organisation of the information

8.1 Logically arranges the information in sections.

82
Identifies the location of information in a table or list of contents.

8.3 There are chapter or section summaries outlining the main findings of each phase of the investigation.

84
When information from external sources has been introduced, a full reference to the source is included.

Presentation of information

8.5 Mentions the relevant EIA legislation, name of the developer, name of competent authorily(ies), name of organisation preparing the EIS, and name, address and contact number of a contact person.

8.6 Includes an introduction briefly describing the proJect, the aims of the assessment, and the methods used.

8.7 The statement is presented as an integrated whole. Data presented in appendices are fully discussed in the main body of the text

8.8 Offers information and analysis to support all conclusions drawn.

--

89 Presents information so as to be comprehensible to the non-specialist. Uses maps, tables, graphical material and other devices as appropriate. Avoids unnecessarily technical or obscure language.

8.10 Discusses all the important data and results in an integrated fashion.

8.11 Avoids superfluous information [i.e. information not needed for the decision).

--

8.12 Presents the information in a concise form with a consistent terminology and logical links between ditterenl sections.

8.13 Gives prominence and emphasis to severe adverse impacts, substantial environmental benefits, and controversial issues.

814
Defines technical terms, acronyms and initials.

8.15 The information is objective, and does not lobby for any particular point of view. Adverse impacts are not disguised by euphemisms or platitudes.

Difficulties compiling the information

8.16 Indicates any gaps in the required data and explains the means used lo deal with them in the assessment.

8.17
Acknowledges and explains any difficulties in assembling or analysing the data needed lo predict impacts, and any basis for questioning assumptions, data or information.

Overall Grade for Section 8 "' Comments

COLLATION SHEET
Minimum requirements of Schedule 4 Part 2 (2011 EIA Regulations)

Criterion
Overall
Areas where more

(1)
A description of the development comprising information on the site, design

and size of the development
(2)
A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse efiects.

--
(3)
The data required to identify and assess the main effects that the development is likely to have on the environment.

(4)
An outline of the main alternatives studied and an indication of the main reasons

for their choice, taking into account tne environmental effects.

--

(5) A non-technical summary of the information provided under 1 to 4 above.

Overall Grade (A-F):

List of Information that is required to complete the EIS

--

--

IAU Best Practice Requirements

Criterion
Overall
Areas where more

Description oi the development

Description of the environment

Scoping, consultation, and impact identification

Prediction and evaluation of impacts

Alternatives

Mitigation and monitoring

Non-technical summary

Organisation and presentation of information

Overall Grade (A-F):

Comments

Appendix 6

Selected EIA journals and websites

Journals Websites

Environmental Impact Assessment Review
www.elsevier.com

The Environmentalist
Institute of Environmental Management and Assessment (!EMA)
www.iema.net

Impact Assessment and Project Appraisal
www.iaia.org/publications/iapa-journal.aspx

Journal o(Environmental Assessment Policy and Management OEAPM) www.worldscinet.com/jeapm
Journal o(Enviromnental Law
www.jel.oxfordjournals.org

Journal o(E11viron111e11tal Management
www.elsevier.com

Journal o(Environmental Planning and Management
www.tandf.eo.uk/journals

Journal o(Environmental Policy and Plam1ing
www.tandf.eo.uk/journals

Journal o(Planning a11d Environment Law
www.sweetandmaxwell.co.uk

Review o(European Community and International Environmental Law
,,vww.wiley.com
United Kingdom

Countryside Council for Wales
www.ccw.gov. uk

Department (or Communities and Local Govemment www.communities.gov.uk/planningandbuild
ing/planningenvironment
Environment Agency
www.environment-agency.gov.uk

Institute o(Environ111e11tal Managemellt and Assessment (JEMA)
www.icma.net

Natural England
www.naturalengland.org.uk

Royal Society (or the Protection o(Rirds (RSPR) www.rspb.org.uk/ourwork/policy/planning/environmentalassessment
Scottish Environment Protection Agency (SEPA)
www.scpa.org.uk

The Scottish Government www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning- Policy/themes/enviro-assessment
Swttish Natural Heritage www.snh.gov.uk/planning-and- development/environmental-assessment
Scotland and Northem Ireland Forwn ofr Environmental Research (SNIFFER) www.seaguidance.org.uk
Strategic Environmental Assessment Information Service
www.sca-info.net
Sustainable Development Commission
www.sd-commission.org.uk

Other European
Arctic Environmental Impact Assessment
www.arcticcentre.ulapland.fi/aria
European Centre fur Nature Conservation
www.ccnc.org
European Commission
www.ec.europa.eu/environment/eia
European Environment Agency
www.eea.europa.eu
List of Ministries Responsible for ETA/SEA in EU Member States
www.ec.europa.eu/environment/eia/contacts
Netherlands Commission for Environmental Assessment
www.eia.nl
Regional Environmental Centre for Central and Eastern Europe
www.rec.org
Russian Regional Environmental Centre
www.rusrec.ru/cn
United Nations Economic Commission for Europe (UNECE)
www.unece.org/env/eia

North America
British Columbia Environmental Assessment Office
www.eao.gov.bc.ca
Canadian Environmental Assessment Agency (CEAA)
www.ceaa.gc.ca
Environment Canada
www.ec.gc.ca
IA/A Western and Northern Canada
www.iaiawnc.org
Ontario Association for Impact Assessment
www.oaia.on.ca
United States Council on Environmental Quality (CEQ)
www.whitehouse.gov/administration/ eop/ceq
United States Environmental Protection Agency (EPA)
www.EPA.gov
United States National Environmelltal Policy Act (NEPA)
www.ceq.hss.doe.gov

Australia and New Zealand
Amtralia11 Government
www.environment.gov.au/epbc/assessments
New Zealand Association for Impact Assessment
www.nzaia.org.nz
New Zealand Ministry for the Environment
www.mfe.govt.nz
New Zealand Parliamentary Commissioner for the Enviromnent
www.pce.parliament.nz

Asia

Chinese Ministry of Environmental Protection
www.english.mep.gov.cn
Environment a11d Sustainable Development in Central Asia and Russia www.caresd.net
Hong Kong Environmental Protection Department www.epd.gov.hk/epd/english/
environmentinhk/eia_planning
Indian EIA Division, Ministry of Environment mu/
Forests
www.envfor.nic.i n/divisions/iass
Japanese Ministry of the Environment
www.env.go.jp/en/policy

Korean Society of Environmental Impact Assessment (KSEIA)
\-vww.cia.or.kr/eng
Malaysian Department of E11viro11111e11t
v.rww.doe.gov.my
Regional Environmental Centre for Central Asia (CAREC)
www.carecnet.org/en
Rep11blic of Korea, Ministry of Environment
www.eng.me.go.kr

Africa
Eastem Africa Association for Impact Assessment
www.ira-eaaia.org
International Association for Impact Assessment (So11th Africa)
www.iaia.co.za
Southern African Institute for Environmental Assessment (SA/EA)
v.rww .saiea.com

International organizations

African Development Rank www.afdb.org/en/topics-sectors/sectors/ environment
Asian Development Rank
www.adb.org/Environment
European Rank for Reconstruction and Development (ERRD)
www.ebrd.com/pages/project/eia
International Association for Impact Assessment
(TAIA)
www.iaia.org
International Imtitute for Environment and Development
www.iied.org
Organisation for Economic Co-operation and Development (OECD)
www.oecd.org
United Nations Economic Commission for Europe (UNECE)
www.unece.org/env/eia
United Natiom Environment Programme (UNEP)
www.unep.org/themes/assessment
World Rank
www.worldbank.org

Health impact assessment

Association of Public Health Observatories: HIA Gateway
www.apho.org.uk
IMPACT: lntemational Health I111p,1ct Assessment Consortium
www.liv.ac.uk/ihia
London Health Commission
www.london.gov.uk/lhc/hia
World Ilea/th Organization
www.who.int/hia/en

Social impact assessment

International Association for Impact Assessment
www.iaia.org/iaiawiki/sia
SIA Hub for Social Impact Assessment practitioners
www.social im pactassessment.net

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